The Law of Neutrality in Outer Space

by

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Abstract

Satellite telecommunications, global navigation and remote sensing systems are key drivers in the ongoing transformation of an industrial based global economic order to one increasingly dominated by information services. A growing number of States are establishing an independent presence in outer space and all States (and indeed, individuals) can access a broad range of affordable space-related products and services (e.g., Google Earth imagery, GPS receivers, and global voice and data transmissions). Consistent with broad historical trends, these technologies are inevitably influencing the way States think about, plan for, and conduct warfare. Inspired by the prospect of seizing the ultimate "high ground" of outer space and achieving "information superiority" over an enemy, militaries around the world are rapidly pursuing independent space capabilities and adapting their strategies, doctrine and force structures to reflect these capabilities. These trends have prompted various political and legal efforts to ban the placement and/or use of weapons in outer space. As these efforts have failed to gain traction and seem unlikely to do so in the foreseeable future, this thesis argues that existing bodies of international law grounded in a pragmatic acceptance of armed conflict must be consulted if humankind wishes to mitigate the impact and spread of warfare conducted in, from and through outer space. In particular, this thesis will examine how the traditional customary principles underlying the law of neutrality may be reconceptualized by States to serve as a mechanism to mediate competing claims of belligerents and neutrals during armed conflict in outer space. After a brief introduction, Chapters One and Two will develop the economic and military trends discussed above. Chapter Three will provide an overview of the relevant international law governing military activities in outer space. Chapter four will analyze the law governing State responsibility for outer space activities to determine which State(s) will bear primary international responsibility for satellite support provided to belligerents during armed conflict. Chapter Five will provide a detailed overview of the law of neutrality and attempt a preliminary analysis of how belligerent and neutral States may seek to adapt this law to suit their interests during armed conflict in outer space. Concluding that the law of neutrality may serve to mitigate the impact and spread of armed conflict in outer space, this thesis offers various proposals designed to facilitate the application of this law.

Unless otherwise noted, the conclusions expressed herein are solely those of the author writing in his personal capacity. They are not intended and should not be thought to represent official ideas, attitudes, or policies of any agency of the United States Government. The author has used publicly-available information in the researching and presentation of this work.

Abstract

Satellite telecommunications, global navigation and remote sensing systems are key drivers in the ongoing transformation of an industrial based global economic order to one increasingly dominated by information services. A growing number of States are establishing an independent presence in outer space and all States (and indeed, individuals) can access a broad range of affordable space-related products and services (e.g., Google Earth imagery, GPS receivers, and global voice and data transmissions). Consistent with broad historical trends, these technologies are inevitably influencing the way States think about, plan for, and conduct warfare. Inspired by the prospect of seizing the ultimate "high ground" of outer space and achieving "information superiority" over an enemy, militaries around the world are rapidly pursuing independent space capabilities and adapting their strategies, doctrine and force structures to reflect these capabilities. These trends have prompted various political and legal efforts to ban the placement and/or use of weapons in outer space. As these efforts have failed to gain traction and seem unlikely to do so in the foreseeable future, this thesis argues that existing bodies of international law grounded in a pragmatic acceptance of armed conflict must be consulted if humankind wishes to mitigate the impact and spread of warfare conducted in, from and through outer space. In particular, this thesis will examine how the traditional customary principles underlying the law of neutrality may be reconceptualized by States to serve as a mechanism to mediate competing claims of belligerents and neutrals during armed conflict in outer space. After a brief introduction, Chapters One and Two will develop the economic and military trends discussed above. Chapter Three will provide an overview of the relevant international law governing military activities in outer space. Chapter four will analyze the law governing State responsibility for outer space activities to determine which State(s) will bear primary international responsibility for satellite support provided to belligerents during armed conflict. Chapter Five will provide a detailed overview of the law of neutrality and attempt a preliminary analysis of how belligerent and neutral States may seek to adapt this law to suit their interests during armed conflict in outer space. Concluding that the law of neutrality may serve to mitigate the impact and spread of armed conflict in outer space, this thesis offers various proposals designed to facilitate the application of this law.

Résumé

Les télécommunications par satellite, sont des éléments moteurs clés dans la transformation en cours de l'industrie basée dans l'ordre de l'économie mondiale et plus en plus dominées par les services d'information. Un nombre croissant d'États sont en train d'établir une présence indépendante dans l'espace, et tous les États (et, de fait, les individus) peuvent accéder à une large gamme de prix abordables liés à l'espace de produits et services (par exemple, des images de Google, les récepteurs GPS et les données de transmissions). En accord avec de larges tendances historiques, ces technologies sont inévitablement influencées par la façon dont les États pensent, planifient et mènent la guerre. Inspirées par la perspective de saisir l'ultime "hauteur" de l'espace et la réalisation de "supériorité des informations" sur un ennemi, les armées du monde entier vont rapidement poursuivre l'acquisition de capacités spatiales et d'adapter leurs stratégies, de la doctrine et des structures pour tenir compte de ces capacités. Ces tendances ont suscité de diverses politiques et juridiques dans les efforts visant à interdire la mise en place et / ou l'utilisation d'armes dans l'espace. Comme ces efforts n'ont pas réussi à obtenir la traction et semble peu probable de le faire dans un avenir prévisible, cette thèse soutient que les organes existants du droit international fondé sur une acceptation pragmatique des conflits armés doivent être consultés si l'humanité veut atténuer l'impact et la propagation de la recherche à travers l'espace. En particulier, cette thèse examinera comment les principes traditionnels qui sous-entendent le droit de la neutralité peuvent être utilisés pour le dialogue les Etats. Après une brève introduction, les chapitres un et deux élaboreront le plan économique et militaire t évoqué ci-dessus. Chapitre Trois fournira un aperçu des dispositions pertinentes du droit international régissant les activités militaires dans l'espace. Le chapitre quatre analysera la loi régissant la responsabilité des Etats pour les activités spatiales afin de déterminer quel État (s) sont responsables de la gestion de télécommunication durant un conflit. Chapitre cinq fournira un aperçu détaillé de la loi de neutralité et de tenter une analyse préliminaire de la manière dont belligérants et neutres États mai vise à adapter cette loi en fonction de leurs intérêts en période de conflit armé dans l'espace. En conclusion, cette thèse propose de diverses propositions visant à faciliter l'application de cette loi.

Acronyms and Abbreviations

ALMV	Air Launched Miniature Vehicle
ASAT	Anti-Satellite Weapon
CBERS-2B	China Brazil Earth Resource Satellite-2B
DMSP	Defense Meteorological Satellite Program
DOD	Department of Defense (US)
DODGC	Department of Defense Office of General Counsel
GATS	General Agreement on Trade in Services
GLONASS	Global Navigation Satellite System (Russian system)
GNSS	Global Navigation Satellite System (general term)
GPS	Global Positioning System
ITU	International Telecommunication Union
EC	European Community
ESA	European Space Agency
EU	European Union
ICJ	International Court of Justice
JDAM	Joint Direct Attack Munition
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NEC	Network Enabled Capability
OIF	Operation Iraqi Freedom
PLA	People's Liberation Army (China)
UN	United Nations
US	United States

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Introduction

While many aspects of the current era of economic globalization have received considerable media and academic attention, one of the lesser appreciated and understood aspects perhaps is the growing economic and military significance of outer space. No longer dominated by the United States and Russia alone, outer space is now populated by a diverse array of satellites operated by an increasing number of States pursuing their own social, economic and military interests. Even non-space faring States (and indeed ordinary individuals) benefit daily from increasingly affordable and ubiquitous access to outer space applications such as satellite telecommunications, Global Positioning System (GPS) devices, and satellite remote sensing imagery. Moreover, space applications are increasingly assuming the role of global public utilities, enabling a broad range of transnational economic activities.[1] Just as the steam-engine and railroads led to substantially reduced transportation costs in late 19th century, fueling the emergence of a global industrial economy, satellite telecommunications, along with fiber-optics, computers and the Internet have substantially reduced communications costs today, fueling a rapidly emerging global information economy.[2]

The growing importance of civil and commercial space systems to continued economic growth has inevitably focused the attention of States on the need to protect these systems. Just as an increasing number of States built and operated global naval forces to protect their merchant vessels on the high seas in the late 19th and early 20th

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[1] See, e.g., Annex on Telecommunications to the General Agreement on Trade in Services (GATS), Article 1, WTO Website < http://www.wto.org/english/tratop_e/serv_e/12-tel_e.htm> (Date Accessed: 8 July 2008) (recognizing the "dual role [of telecommunications] as a distinct sector of economic activity and as the underlying transport means for other economic activities").

[2] Thomas L. Friedman, *The Lexus and the Olive Tree*, xviii (New York: Anchor Books, 1999).

centuries, they are likewise today adapting their military capabilities and strategies to protect the ability of their civil and commercial satellites to traverse the global commons of outer space. Aside from the need to protect commerce, the ultimate "high ground" of outer space also offers inherent military advantages. Space applications exploiting these advantages are revolutionizing the way States conduct war.

The combined effect of these developments, of course, is the increasing militarization of outer space and the prospect of armed conflict conducted in and through outer space. Efforts in the United Nations (UN) and the Conference on Disarmament to ban the placement and/or use of weapons in outer space have reached a diplomatic stalemate.[3] Proceeding under the likely assumption that these diplomatic efforts will fail to progress, this thesis will explore the application in outer space of customary principles of international law grounded in the pragmatic recognition that armed conflict is inevitable, but must be contained to the maximum extent possible. Specifically, this thesis will analyze the application in outer space of the traditional principles underlying the law of neutrality. The law of neutrality applies once armed conflict has commenced and is intended to limit the spread of hostilities and to minimize the impact of hostilities on global trade. As we will see, the law of neutrality is not so much a collection of specific rules, but rather a flexible and dynamic set of general principles designed to serve as a mechanism to balance and reconcile competing claims of belligerents (States participating in armed conflict) and neutrals (non-participant States). Approached from

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[3] See Michel Bourbonniere, "The Ambit of the Law of Neutrality and Space Security" (2006) 36 Israel Y.B. on Human Rights 205, 216-17 (discussing stalemate in UN and Conference on Disarmament on space weaponization). The UN General Assembly has expressed deep concern regarding space weaponization. See e.g., UN GAOR 51/44, 51st Sess., *Prevention of an arms race in outer space*, UN Doc. A/51/49 (7 January 1997) (expressing the importance and urgency of preventing an arms race in outer space).

this perspective, the law of neutrality may very well prove "necessary for the maintenance of global public order" in outer space.[4]

Chapter One will outline the emerging related trends of increasing State access to outer space, the growing significance of space applications in a globalized information economy, the prevalence of bilateral and multilateral civil, commercial and military space partnerships, and military reliance on commercial space systems. As a prelude to our later discussion, Chapter One will preview how these trends give rise to various issues under the law of neutrality.

Chapter Two will provide a historical overview of space-based support to terrestrial armed conflict and analyze emerging military doctrines and capabilities in outer space that are revolutionizing the way States conduct war.

Chapter Three will provide an overview and analysis of international law governing military operations in outer space with particular emphasis on the status of neutral States where appropriate. This analysis will frame our subsequent discussion of the law of neutrality. More specifically, Chapter Three will examine: (1) treaty law directly applicable to military operations in outer space, (2) constraints on the use of force imposed by the *UN Charter*, and (3) the law of armed conflict (i.e., *just in bello*) governing hostilities once they have commenced.

Chapter Four will provide an analysis of the international law governing State responsibility for outer space activities. As we will see, the law in this area is vague and unsettled, yet nonetheless critical to the effective application the law of neutrality.

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[4] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 216.

Chapter Four will offer specific recommendations to clarify the law in this area based on recent International Court of Justice (ICJ) case law.

Chapter Five will provide an extensive discussion and analysis of the law of neutrality in outer space. We will begin with an overview of the general principles underlying the law of neutrality as codified in the 1907 Hague Conventions governing land and naval warfare.[5] We will also introduce the corresponding belligerent rights of contraband, blockade and cable cutting, which are indispensible to a comprehensive understanding of the nature and scope of the law of neutrality. We will next examine the application and continued viability of the law of neutrality in the *UN Charter* era. Finally, we will analyze the application of the law of neutrality to belligerent and neutral use of satellite telecommunications, global navigation satellite systems, and remote sensing satellite systems. This analysis will offer a tentative assessment of how belligerent and neutral States will seek to reconceptualize and apply the general principles of neutrality developed in the context of land and naval warfare to armed conflict conducted in and through the domain of outer space. Chapter Six will provide a brief conclusion.

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[5] *Hague Convention (V) Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land*, 18 October 1907, 1 Bevans 654 [*Hague V*]; *Hague Convention (XIII) Rights and Duties of Neutral Powers in Naval War*, 18 October 1907, 1 Bevans 723 [*Hague 13*].

Chapter One: Globalized Access to Outer Space

The past two decades have witnessed a dramatic increase in both the number of space-faring States and the commercialization of space applications. Forty-seven (47) States have placed a satellite into orbit independently or with the launch services of others and ten (10) States have demonstrated independent orbital launch capability.[6] One factor accounting for this dramatic increase is the emergence of an increasingly competitive $2.5 billion a year commercial launch market.[7] India and China entered the market in 2007, joining the United States, Russia, Ukraine and the European Space Agency.[8] The leading commercial providers include Lockheed Martin and Boeing from the United States, Arianespace (Europe), Energia (Russia), and two private multinational consortia – Sea Launch and International Launch Services.[9] Twenty-three (23) of the 68 successful orbital launches in 2007 were commercial in nature, marking the third consecutive annual increase in commercial launches since 2004.[10] India's initial foray into the market raised the prospect of potential downward competitive price pressures -- its successful launch of an Italian astronomy satellite into low Earth orbit at a price of $11 million represented a 30-40% price reduction relative to charges levied by other launch

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[6] *Space Security 2007*, 58-59 (Canada: Project Ploughshares, August 2007), online: <http://www.spacesecurity.org/SSI2007.pdf> (accessed: 8 July 2008).

[7] "India Launches Israeli Satellite," *BBC News*, online: <http://news.bbc.co.uk/2/hi/south_asia/7199736.stm> (accessed: 31 May 2008).

[8] Anil Penna, "India launches Israeli satellite in boost to space business" Agence France-Presse (21 January 2008) online: <http://www.canada.com/topics/technology/science/story.html?id=68e69c99-33d2-4106-b739-a891169539c2&k=11055 (accessed: 12 March 2008).

[9] *Space Security 2007*, *supra* note 6 at 76 and sources cited therein.

[10] Futron Corporation, *Launch Report* (January 2008), online: Futron Corporation <http://www.futron.com/pdf/friends_of_futron_reports/launch_reports/FutronLR2008-01.pdf> (accessed: 23 February 2008).

providers.[11] China's entry into the market was heralded by its launch of Nigeria's Nigocomsat-1 communications satellite into geostationary orbit in 2007 – following the launch, Chinese officials claimed it had been "commissioned to send about 30 foreign satellites into space" and had "signed several contracts offering commercial launching services for foreign satellites, including one from Venezuela."[12]

The above examples also illustrate the emerging prevalence of bilateral and multilateral space partnerships as a central enabler to the continued growth in the number of States accessing space. China and Brazil partnered in the September 2007 launch of the optical imaging CBERS-2B satellite (China Brazil Earth Resource Satellite-2B).[13] Both States agreed to provide land images from the satellite to African States along with imagery processing and analysis software with the goal of enabling these States to respond to threats such as deforestation, desertification and drought.[14] Partnering with the Ukranian Yuzhnoye Design Bureau, Egypt built and procured the launch of its first Earth observation satellite designed "to support development in the fields of construction, cultivation and fighting desertification."[15] While many of these partnerships are publicly described and promoted as civil in orientation, the technologies and applications

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[11] "India Commercial Rocket Takes Off' *BBC News* (23 April 2007), online: <http://news.bbc.co.uk/2/hi/south_asia/6582773.stm> (accessed: 23 February 2008).

[12] "Satellite launch for Nigeria marks expansion for China's launching" *Associated Press* (24 May 2007) online: KomoTv.com <http://www.komotv/news/tech/7494812.html> (accessed: 23 February 2008).

[13] "China, Brazil give Africa free satellite land images" *SpaceMart.com* (28.11.07) online: <http:www.spacemart.com/reports/China_Brazil_give_Africa_free_satellite_land_images_999.html > (accessed: 27 February 2008).

[14] "China Launches 3rd Earth Observation Satellite – News Agency" *RIA Novosti* online: <http://en.rian.ru/world/20070919/79431180.html> (date accessed: 1 February 2008).

[15] "Egypt: first Earth observation satellite (Egyptsat-1) launched," online: <http://vague.eurorcom.fr/thematicdirs/news/snews617774> (date accessed: 27 February 2008).

employed (e.g., remote sensing) are inherently dual-use in nature, and thus capable of providing militarily useful data such as troop, aircraft, vessel and equipment positioning and concentrations.

Indeed, some of these partnerships are overtly military or security related. For example, following its successful launch of Italy's astronomy satellite, India launched an Israeli spy satellite into a low Earth polar orbit on 21 January 2008.[16] According to one source, "the 200kg (650-pound) satellite is reported to be Israel's most advanced space craft, and equipped with a camera that can take pictures in almost any weather conditions."[17] Given the sensitivity inherent in a partnership of this nature, details are unclear, but one source notes that "India is interested in using Israel's . . . satellite for military reconnaissance . . . focussed on . . . Bangladesh, Pakistan, Sri Lanka and China – and, increasingly, the US."[18]

While an increasing number of States are launching or procuring the launch of their own satellites, the rapidly evolving commercialization of space applications allows any State (or person for that matter) to benefit from such applications. Satellite services available on the open market include mobile data and voice, fixed broadband (voice, video and data), private networks, remote sensing, satellite transponder use/lease agreements, and television and radio broadcasting.[19] The global satellite industry at large

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[16] "India Launches Israeli Satellite," *surpa* note 7.

[17] *Ibid.*

[18] Neelam Matthews, "India's Military Wants Advanced-imaging Satellites and a Role in the Country's Space Program" *Defense Technology International*, 44 (November 2007), online: <http://www.nxtbook.com/nxtbooks/aw/dti1107/index.php?startid=24> (accessed: 8 July 2008), citing information provided by the Center for Strategic and International Studies.

includes these services along with satellite manufacturing[20], ground equipment[21], and the launch sector.[22] Global satellite industry revenues averaged an annual growth of 10.5% for the period of 2001-2006. Revenues for satellite services in particular increased by almost 100% from US $32.3 billion in 2001 to US $62.6 billion in 2006.[23] One of the "key market drivers" for the growth in the satellite industry has been "continued government and military demand and investment."[24]

The market for mobile satellite telecommunications services has witnessed sustained growth with revenues increasing steadily from US $1.3 billion (2001), to $1.3 billion (2002), $1.6 billion (2003), $1.8 billion (2004), $1.7 (2005) and $2.0 billion (2006).[25] Government and military applications are a "key market driver" and "account for [the] surge in required satellite bandwidth" to meet mobile broadband demand.[26] Militarily, mobile satellite telecommunications provide armed forces with an unprecedented ability to project command and control across a wide theater of operations.

A diverse range of public international and private consortia are dominant players in the satellite telecommunications market. Intergovernmental organizations such as

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[19] Futron Corporation, *June 2007 Satellite Industry Statistics,* 3, online: <http://www.sia.org/PDF/2007StateofSatelliteIndustryReport.pdf> (accessed: 1 June 2008)

[20] *Ibid.*

[21] *Ibid.* Ground equipment includes, amongst other things, mobile terminals, satellite control stations, direct-broadcasting dishes, hand-held phone and digital audio radio devices.

[22] *Ibid.* The launch sector includes launch services, vehicle manufacturing and manufacturing of components and subsystems.

[23] *Ibid.* at 7.

[24] *Ibid.* at 26.

[25] *Ibid.* at 10.

[26] *Ibid.* at 24, 27.

INTELSAT and EUTELSAT have now privatized, while others such as INTERSPUTNIK and ARABSAT have not. What are the respective rights and duties of these corporations and organizations (to include their member States) during international armed conflict? Are they required to deny services to belligerent parties, or can they provide them on a non-discriminatory basis? If they are authorized to provide services, must they acquiesce to belligerent attempts to interrupt or otherwise deny transmissions to enemy forces? The complex corporate and governance structures of these entities, coupled with ambiguities in space law relating to State responsibility make it difficult to answer these questions definitively, but we will explore some likely answers in Chapters Four and Five based on the application of recent ICJ case law and the customary international law of neutrality, contraband and blockade.

Global Navigation Satellite Systems (GNSS) also illustrate the rapidly emerging trend of ubiquitous global access to advanced space technologies. The US Government owned 24-satellite constellation known as the GPS has been fully operational April 1995.[27] The US Air Force operates the GPS, but as discussed below, the US makes the signals available to civil users world-wide, cost-free.[28] The Russian Government owned Global Navigation Satellite System (GLONASS) has fielded 18 of an anticipated 24 satellites, with completion of the constellation expected by 2010-2011.[29] GLONASS is

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[27] U.S., United States Air Force, *Global Positioning System Fact Sheet*, online: <http://www.af.mil/factsheets/factsheet.asp?id=119> (accessed: 1 June 2008).

[28] *Ibid.*

[29] Nikolai Sokov, "Russian Military is Working to Enhance Precision Targeting and Early Warning Capabilities," *WMD Insights* (December 2007/January 2008), online: <http://www.wmdinsights.com/I21/I21_RU1_RussianMilitary.htm> (accessed: 21 February 2008); Y. Zaitsev, "GLONASS Potential Still To Be Realised" *GPS Daily* (May 1, 2007), online: http://www.gpsdaily.com/reports/GLONASS_Potential_Still_To_Be_Realised_999.html (accessed: 1

operated by the Russian military Space Forces.[30] The European Galileo system is a joint initiative of the European Commission (EC) and the European Space Agency (ESA) designed to provide Europe with an independent alternative to the GPS and GLONASS.[31] A private consortium was initially responsible for building and operating Galileo, but after concluding that the project was not economically viable, the consortium collapsed in 2007 - ultimately, the EU agreed to assume control and finance the Euro 3.4 billion system.[32] Two (2) of the planned 30 Galileo satellites have been launched to date[33] with an anticipated completion date of 2013.[34]

GNSS's have proven tremendously successful both militarily and commercially. GPS signals provide users with highly accurate, three-dimensional location information (latitude, longitude and altitude), velocity (speed and direction) and precise time.[35] The constellation supports an unlimited number of users world-wide and provides continuous

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February 2008) (noting that ongoing problems with the ground segment may delay completion of the GLONASS until after 2010-2011).

[30] "GLONASS" *Globalsecurity.org*, online: <http://www.globalsecurity.org/space/world/russia/glonass.htm> (accessed: 1 June 2008); "GLONASS" Federation of American Scientists (FAS) Space Policy Project, *World Space Guide*, available at http://www.fas.org/spp/guide/russia/nav/glonass.htm (accessed: 1 June 2008).

[31] E.S.A., "What is Galileo?" European Space Agency, online: <http://www.gsa.europa.eu/go/galileo/why-galileo> (accessed: 1 June 2008); European GNSS Supervisory Authority, "Why Galileo?" online: <http://www.gsa.europa.eu/go/galileo/why-galileo> (accessed: 1 June 2008).

[32] "'Unanimous Backing' for Galileo" *BBC News* (30 November 2007), online: <http://news.bbc.co.uk/1/hi/sci/tech/7120041.stm> (accessed: 1 June 2008).

[33] E.S.A., "GIOVE-B Transmitting its First Signal" *European Space Agency News Release* (7 May 2008), online: <http://www.esa.int/esaNA/SEMGVUZXUFF_galileo_0.html> (accessed: 1 June 2008).

[34] "'Unanimous Backing'", *BBC News*, *supra* note 32.

[35] Global Positioning System Fact Sheet, United States Air Force (March 2007), available at <http://www.af.mil/factsheets/factsheet.asp?id=119> (date accessed: 1 June 2008).

real-time data in all weather conditions.[36] Allied forces successfully demonstrated the utility of GPS during the Gulf War (1991).[37]

The US Government announced its intention to make GPS signals available to civil users in 1983 following the downing of Korean Air Flight 007 by the Soviet Union after the aircraft accidentally strayed into Soviet airspace.[38] Current US policy provides that the Government will make GPS signals available "on a continuous, worldwide basis . . . free of direct user fees for civil, commercial, and scientific uses . . . ."[39] This policy, coupled with the US Government's 2000 decision to discontinue deliberate degradation of the accuracy of non-military signals[40] has resulted in a veritable boom in the global market for GPS equipment and services. The GPS market is estimated to exceed US $30 million in 2008.[41] GPS applications include in-vehicle and hand-held navigation devices, fleet and supply chain management, air traffic control/navigation, automobile traffic monitoring and control, emergency response, precision farming and surveying, just to name a few. The global reliance on GPS is pronounced. According to the recently released *World GPS Market Forecast to 2012*, the rapid development of the GPS market in countries like China and India will result in the majority of navigation systems being

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[36] U.S., United States Air Force, *Global Positioning System Fact Sheet*, *supra* note 27.

[37] See discussion and analysis, *infra*, Chapter Two.

[38] U.S., Cheryl Pellerin, "United States Updates Global Positioning System Technology" (3 February 2006), online <http://www.america.gov/st/washfile-english/2006/February/20060203125928lcnirellep0.5061609.html> (accessed: 1 June 2008).

[39] U.S., National Executive Committee, *Space-Based Positioning, Navigation, and Timing Policy Fact Sheet*, Section III (December 15, 2004), online: <http://pnt.gov/policy> (accessed: 8 July 2008) [*US GPS Policy*]

[40] *Ibid.* at Section II.

[41] *RNCOS GPS Market Update* (2006), online: <http://www.reportbuyer.com/telecoms/satellite_broadcast/gps_market_update_2006.html>

shipped to the Asia-Pacific region by 2012.[42] Japan currently has the highest number of in-vehicle navigation systems followed by North American and European countries.[43]

Future armed conflicts will almost certainly witness belligerent State attempts to broadly integrate GNSS into their planning and operations, whether they own and operate their own GNSS or merely receive signals from other systems.[44] This development appears inevitable given the obvious military benefits of GNSS, the current (GPS) and anticipated global availability of signals (Galileo and GLONASS), and the ubiquitous availability of equipment and services on the open market. In the event the US, Russia and European States are not belligerent parties to a particular armed conflict and choose to remain neutral, will they be obligated to deny belligerents access to their GNSS signals in order to remain neutral? What if they provide signals to all belligerents on a non-discriminatory basis? If neutral GNSS providers are not required to deny access to their signals, must they nonetheless acquiesce to belligerent efforts to deny enemy forces the ability to access them? While not explicitly addressing the matter of neutrality, current US GPS policy hints at where the US may stand on these questions. As a belligerent, the US will deny enemy use of the GPS and "any other space-based position, navigation and timing systems without unduly disrupting civil, commercial, and scientific uses of these

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[42] *World GPS Market Forecast to 2012* (31 March 2008), online:
< http://www.giiexpress.com/products/rnc63842>

[43] *Ibid.*

[44] The U.S. GPS Policy provides, "whether designed for military capabilities or not, all positioning, navigation, and timing signals from space and their augmentations provide inherent capabilities that can be used by adversaries, including enemy military forces and terrorist groups." *US GPS Policy*, *supra* note 39 at Section II.

services outside an area of military operations . . . ."[45] We will analyze these issues in Chapter Five.

With respect to satellite remote sensing, private firms such as Google Earth, Keyhole, DigitalGlobe and Space Imaging "sell or give away high-resolution satellite photos via the Internet."[46] The quality of this imagery is truly remarkable, in some cases allowing for the identification of objects as small as eighteen (18) inches wide.[47] ImageSat International, an Israeli-owned firm, "offers customers the opportunity to redirect its EROS-A imaging satellite (launched in 2000 aboard a Russian rocket) and download its data in total secrecy with few if any restrictions."[48] According to the firm's CEO, "[o]ur customers, in effect, acquire their own reconnaissance satellite . . . at a fraction of the cost that it would take to build their own."[49] Revenue for global commercial satellite remote sensing increased approximately 18% from 2004 to 2005[50] and 16% from 2005-2006[51], "driven by evolving business opportunities [including] new

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[45] *Ibid.* at Section VI. The U.S. Secretary of Defense shall "[d]eny to adversaries position, navigation, and timing services from the Global Positioning System . . . *and/or any other* space-based position, navigation and timing systems without unduly disrupting civil, commercial, and scientific uses of these services outside an area of military operations . . . ." (emphasis added).

[46] Max Boot, *War Made New – Technology, Warfare, and the Course of History 1500-Today*, 427 (New York: Gotham Books, 2006). [*War Made New*]

[47] *Ibid.*

[48] *Ibid. see also*, Matthews, "India's Military Wants Advanced-imaging Satellites and a Role in the Country's Space Program", *surpa* note 18 ("Israel has actively marketed services from its Eros-A and Eros-B high-resolution satellites to governments world-wide. In the process, Israel helps defray the cost of its space program by allowing other customers to use them at times when they are not over an area where Israel has a strategic interest").

[49] Boot, *War Made New*, *supra* note *46.*

[50] Futron Corporation, *June 2007 Satellite Industry Statistics*, *supra* note 19 at 12.

[51] *Ibid.*

and continuing military and intelligence imagery contracts . . . ."[52] This trend clearly suggests that in future armed conflicts, States incapable of fielding their own satellite reconnaissance systems will almost certainly seek imagery from allies, neutral third-parties or from commercial open market sources. We will explore these issues in Chapter Five, noting key differences in how the law of neutrality will likely apply to remote sensing as opposed to satellite telecommunications and GNSS.

[52] *Ibid.*

Chapter Two: Space Support to Military Operations

Just as space applications are contributing to the transformation of an industrial based economic order to one increasingly dominated by information services, space is also enabling the transformation of 21st century military strategy and warfare. This development reflects the truism that historically, "States prepare for and wage war according to their distinct natures."[53] Moreover, "[m]ilitary theory evolves in response to changes in technology. It is a normal activity for strategists and war planners in any military to consider how advances in weapons and technology affect warfare and to explore how to adapt to these changes."[54] The emerging significance of space to current and future military operations was concisely stated in 2005 by General Lance Lord, then commander of the United States Air Force Space Command: "Space superiority is the future of warfare. We cannot win a war without controlling the high ground, and the high ground is space."[55]

This chapter will proceed in three parts: (1) we will first sketch the emerging doctrinal and theoretical underpinnings of space-based support to terrestrial military operations, focusing on the need of operational forces to achieve battle-space information superiority over enemy forces; (2) we will then briefly review the historical evolution of space-based military support from the dawn of the space age to the present; and (3) finally, we will examine relevant aspects of US counter-space doctrine as a predictive

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[53] Colin S. Gray, "The Influence of Space Power upon History" (1996) 15 Comparative Strategy 293, 296. Gray goes on to state that "[m]odern postindustrial societies are information led across the board of economic and leisure activity. Collectively viewed, defense preparation and war comprise a social institution. Information age countries cannot help but incline toward the waging of information war." *Ibid.*

[54] Larry M. Wortzel, *The Chinese People's Liberation Army and Space Warfare*, 1 (American Enterprise Institute, 2007).

[55] General L.W. Lord, "Space Superiority" (Winter 2005) High Frontier at 4.

indicator of how States will likely attempt to counter enemy access to space-based support in future armed conflicts.

A. Emerging Doctrine and Theory of Information Warfare and Space-Based Support to Terrestrial Military Operations

As General Lord's comment above attests, space is the latest and perhaps ultimate variant of the age-old doctrine urging military commanders to seize and hold the high ground. Space systems enable a force to "look down on friend and foe" alike and are "both global and of . . . infinite military depth."[56] A foundational principle of US space doctrine asserts that "[s]pace is a domain – like the air, land, sea and cyberspace – within which military operations take place."[57] Space power is unique in relation to other forms of military power "due to its global perspective, responsiveness, and persistence" which "contribute to situational awareness, highly accurate, all-weather weapon system employment, rapid operational tempo, information superiority, increased survivability, and more efficient military operations."[58]

Assuming a force is technologically, organizationally and doctrinally postured to integrate space technology and data into its operations[59], it is well positioned to "achieve[] information superiority in terms of accuracy, relevance, and timeliness,

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[56] Gray, "The Influence of Space Power upon History", *supra* note 53 at 296.

[57] U.S., United States Air Force, *Space Operations*, Air Force Doctrine Document 2-2, (27 November 2006) at vii, 3, online: Joint Electronic Library <http:www.dtic.mil/doctrine> [*US Air Force Space Operations*].

[58] *Ibid.* at vii.

[59] Scholars note that technology must be broadly integrated into operations in order to be effective. Max Boot notes that historically, "technology alone rarely confers an insurmountable military edge; tactics, organization, training, leadership and other products of an effective bureaucracy are necessary to realize the full potential of new inventions." Boot, *War Made New*, *supra* note *46* at 15.

thereby having a dramatically better awareness or understanding of the battlespace."[60] US Department of Defense (DOD) doctrine describes "information superiority" as "the operational advantage gained by the ability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying the adversary's ability to do the same."[61] Information superiority can be decisive in combat -- "[h]istory indicates that the speed and accuracy of information available to military commanders is the significant factor in determining the outcome on the battlefield."[62] Indeed, a 2003 DOD publication asserts that "[t]he power of superiority in the information domain mandates the United States fight for it as a first priority even before hostilities begin . . . ."[63] Echoing this approach, a more recent DOD publication asserts that achieving information superiority is the first "governing principle" of a force postured to achieve battle-space dominance.[64]

What military advantages are derived from information superiority? Superiority in the information realm enables a force to act inside an enemy's decision loop – in other words, the force with superior information can observe and orient itself to an opponent and events in the battlespace, decide on a course of action and execute it faster than the opponent can do the same. As one commentator notes, "[a]t a philosophical and practical level what confers a key advantage in engagements is the ability to stay ahead of an

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[60] Arthur K. Cebrowski, "CNE in the Network-Centric Battlespace: Challenges for Operations and Lawyers" (1998) 76 Int'l L. Studies 1, 3. ["CNE in the Network-Centric Battlespace"]

[61] U.S., Chairman of the Joint Chiefs of Staff, *Information Operations*, Joint Publication 3-13, I-5, Section 3(f) (13 February 2006), online < Joint Electronic Library <http:www.dtic.mil/doctrine>

[62] *Ibid.* at I-10, Section 6(a).

[63] U.S., Department of Defense, *Joint Operations Concepts* (2003), quoted in U.S., United States Department of Defense, *The Implementation of Network-Centric Warfare*, 16 (2005). [*US DOD Implementation of Network-Centric Warfare*]

[64] *US DOD Implementation of Network-Centric Warfare*, *supra* note 63 at 8.

opponent and dictate the tempo of the engagement - to maintain the initiative and keep an opponent off balance."[65] If information superiority is coupled with the ability to rapidly decide upon and precisely execute a course of action (e.g., deliver weapons on target to achieve desired effects), a force may be able to produce so-called "decisional paralysis" in the enemy. "Decisional paralysis" is the "rapid reduction of the enemy's options and the shock of rapid and closely coupled effects on his forces. This disrupts the enemy's strategy and, it is hoped, forecloses the options available to him."[66]

How do space applications factor into achieving information superiority? Data transmitted from space assets (e.g., remote sensing imagery) can be rapidly processed, analyzed and transmitted as intelligence via satellite telecommunications to commanders and forces deployed throughout a theater of operations. In some instances, tactically engaged forces can directly access and exploit raw space data (e.g., integrated GPS signals and imagery) and collaborate or independently "self-synchronize"[67] their operations with minimal command and control oversight. This process holds the promise

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[65] Dr. Carlo Kopp, "Understanding Network Centric Warfare" (January/February 2005), Australian Aviation, online: <http://www.ausairpower.net/TE-NCW-JanFeb-05.html > (accessed: 5 June 2008). Describing US Air Force strategist John Boyd's concept of the OODA loop (Observation-Orientation-Decision-Action), Dr. Kopp notes:

> The opponent must be observed to gather information, the attacker must orient himself to the situation or context, then decide and act accordingly. The OODA loop is thus fundamental to all military operations, from strategic down to individual combat. [The] loop is an inevitable part of reality and has been so since the first tribal wars of 25,000 years ago, as it is fundamental to any predator-prey interaction in the biological world. *Ibid.*

[66] Cebrowski, "CNE in the Network-Centric Battlespace", *supra* note 60 at 3.

[67] *US DOD Implementation of Network-Centric Warfare*, *supra* note 63 at 9. Describing self-synchronization as the ability to "[i]ncrease the opportunity for low-level forces to operate nearly autonomously and to re-task themselves through exploitation of shared awareness and the commander's intent." Self-synchronization can produce "a meaningful increase in operational tempo and responsiveness" and allow forces to "rapidly adapt when important developments occur in the battlespace and eliminate the step function character of traditional military operations." *Ibid.*

of "compress[ing] decision timelines to turn information advantage into decision superiority and decisive effects."[68] It is important to note that while space systems have emerged as a necessary precondition to achieving information superiority, they are but one part of a comprehensive network of systems including other sensors (e.g., ground based radar and aerial surveillance and reconnaissance), transmission capabilities (e.g., fiber-optic and terrestrial wireless voice/data/internet) and computers (e.g., used for processing and analyzing data). The goal of emerging concepts of so-called network-centric warfare is to seamlessly fuse and network these systems with the war-fighter.

Although the US clearly stands at the technological and doctrinal forefront in pioneering the type of information-based, network-centric warfare described above, other States are quickly following suit. Describing the genesis of China's emerging space warfare doctrine, one author notes "the PLA [Chinese People's Liberation Army] has carefully absorbed and is reacting to what the US military has published on space warfare and counter-space operations."[69] While there is no formal Chinese doctrine or policy publicly available, PLA strategists appear to be crafting a doctrine of "informationalized" warfare premised on the belief that "it is in space that information age warfare will come to its more intensive points. Future war must combine information, firepower, and mobility."[70] In a passage bearing striking resemblance to the concept "decisional paralysis" discussed above, one PLA strategist argues:

> [The] goal of a space shock and awe strike is [to] deter the

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[68] *Ibid.*

[69] Wortzel, *The Chinese People's Liberation Army and Space Warfare*, supra note 54 at 1.

[70] *Ibid.* at 2, notes 17 and 20 (citing various PLA and Chinese authors).

> enemy, not to provoke the enemy into combat. For this reason, the objectives selected for strike must be few and precise. . . [for example] on important information sources, command and control centers, communications hubs, and other objectives. This will shake the structure of the opponent's operational system of organization and will create huge psychological impact on the opponent's policymakers.[71]

India also clearly recognizes the advantages of integrating space-based information applications into military planning and operations. According to one senior Indian Air Force official, "[m]ilitarization of space is a [phrase] people are averse to using, but there is no doubt we need it imminently for imagery and to shorten the loop between the sensor and shooter." [72] The Indian Air Force "has presented a military space-doctrine on its surveillance, reconnaissance and communications requirements"[73] and "[f]ormer Indian Air Force Air Chief Marshal S. P. Tyagi recently advocated establishing a jointly manned 'aerospace command' for India to use the missile, satellite, and communications capabilities of the Indian armed forces effectively."[74]

The North Atlantic Treaty Organization (NATO) is also prioritizing what it refers to as "Network Enabled Capability" (NEC).[75] The NATO NEC initiative "aims to ensure that the Alliance's multinational forces are 'wired' for 21st century operations, able to

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[71] U.S., Department of Defense, *Annual Report to Congress, Military Power of the People's Republic of China* (2008), online: U.S. Department of Defense Publications <http://www.defenselink.mil/pubs/china.html> quoting Colonel Yuan Zelu, *Joint Space Warfare Campaigns* (2005) (no page citation or publication information provided).

[72] Matthews, "India's Military Wants Advanced-imaging Satellites and a Role in the Country's Space Program", *supra* note 18 at 46..

[73] Ibid.

[74] Wortzel, *The Chinese People's Liberation Army and Space Warfare*, supra note 54 at 1, citing Dipindra Nalan Chakravarthi, "Future Aerospace Power," *New Delhi Force* (1 September 2007), in Open Source Center (OSC) SAP20070912342003.

[75] "Information Superiority Key to Success in Operations" News: North Atlantic Treaty Organization (30 April – 2 May 2008), online: <http://www.nato.int/docu/update/2008/04-april/e0430a.html> (accessed: 5 June 2008).

share and exchange information effectively to achieve information and decision superiority."[76] NATO's operations in Afghanistan are witnessing the integration of "state of the art reconnaissance, communication, information, intelligence and surveillance technologies."[77] According to NATO's Deputy Supreme Allied Commander for Transformation, Admiral Luciano Zappata, "[o]ver the past year, we have seen tremendous progress in areas such as friendly force tracking and the impact on the ground [in Afghanistan] is clear . . . [o]ur soldiers are safer and commanders have a vastly superior situational awareness."[78]

B. Historical Evolution of Space-Based Support to Terrestrial Military Operations

Military and national security matters were of foremost importance for the United States and Soviet Union from the very beginning of the space age. As the Cold War standoff between the US and Soviet Union intensified in the late 1950s, the Eisenhower administration urgently pursued the development and deployment of reconnaissance satellites as "a means of penetrating Soviet secretiveness."[79] One noted military space historian has argued that perhaps the primary aim of US space policy between 1957-1966 was establishment of the principle of "freedom of space" and the corresponding right of unimpeded over-flight in outer space for military reconnaissance satellites.[80]

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[76] *Ibid.*

[77] *Ibid.*

[78] *Ibid.*

[79] Paul B. Stares, *The Militarization of Space: U.S. Policy*, 1945-1984, 46 (Ithaca, N.Y.: Cornell University Press, 1987) at 46; Christopher M. Petras, "'Eyes'" on Freedom – A View of the Law Governing Military Use of Satellite Reconnaissance in U.S. Homeland Defense" (2005) 31 J. of Space Law 81, 86.

[80] Stares, *The Militarization of Space: U.S. Policy, 1945-1984*, *supra* note 79 at 46.

While initially focussed on gathering photographic intelligence and providing early warning of missile launch capability over the Soviet Union, US military space programs gradually evolved and were adapted to serve the operational and tactical needs of commanders during armed conflict. Space support to terrestrial military operations began in earnest during the Vietnam War. Two Defense Meteorological Satellite Program (DMSP) ground stations were deployed to Vietnam and Thailand to support US military operations with weather data.[81] The DMSP data "became the primary short-term forecasting tool for tactical military operations" leading the commander of US Air Force operations in Southeast Asia to conclude, "As far as I am concerned, this [satellite] weather picture is probably the greatest innovation of the war."[82] The US military also began utilizing satellite telecommunications during the Vietnam War. The military used a National Aeronautics and Space Administration (NASA) synchronous communications satellite to connect Saigon to Hawaii and also leased commercial capacity (also between Saigon and Hawaii) to meet administrative and logistical needs.[83] According to current US Air Force doctrine governing space operations, "satellite usage during the Vietnam conflict established the military practice of relying on civil and commercial space systems."[84]

These developments, however, were merely embryonic in nature. Space applications were fully integrated into the planning and waging of warfare for the first time in the 1991 Persian Gulf War. According to the US Air Force Chief of Staff, Merrill

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[81] *US Air Force Space Operations, supra* note 57 at 34.

[82] *Ibid.*

[83] *Ibid.* at 36.

[84] *Ibid.*

McPeak, the Gulf War was "the first 'space war', since it was the first occasion on which the full range of modern military space assets was applied to a terrestrial conflict."[85] During the conflict, the US utilized seven imaging satellites (the largest number of such satellites that it had ever had in orbit at one time) -- these satellites passed over the theater of operations 12 times per day.[86] Additionally, the US operated between 15 and 20 signals intelligence satellites, intercepting Iraqi communications.[87] The US military also had at its disposal "three defense weather satellites, at least four military communications satellites and up to 16 'Navstar' Global Positioning System (GPS) satellites."[88] GPS allowed US air and ground forces to navigate the featureless Arabian Desert terrain during 24 hour, all-weather operations.[89] The US also spent approximately $6 million on "data from US-owned Land Remote Sensing Satellite and French-owned SPOT imaging satellites . . . . [t]hese satellites were used to provide wide-area surveillance to augment and complement US intelligence satellites." [90] Building on the precedent established

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[85] Quoted in Ivan A. Vlasic, "Space Law and the Military Applications of Space Technology" (1995) at 484, published in *ASPL-637: Space Law: General Principles Volume I* (Professor Ram Jakhu) (Montreal: McGill University, 2007); U.S., Department of Defense, *Report to Congress, Conduct of the Persian Gulf War* (April 1992), cited in U.S., Chairman of the Joint Chiefs of Staff, *Joint Doctrine for Space Operations*, Joint Publication 3-14 (9 August 2002) at IV9, online: Joint Electronic Library <http:www.dtic.mil/doctrine> ("The war with Iraq was the first conflict in history to make comprehensive use of space systems support. All of the following helped the Coalition's air, ground, and naval forces: The DMSP [Defense Meteorological Support Program] weather satellites; US LANDSAT [land satellite] multi-spectral imagery satellites; the GPS; DSP early warning satellites; the tactical receive equipment and related applications satellite broadcast; the Tactical Information Broadcast Service; as well as communications satellites.")

[86] Quoted in Ivan A. Vlasic, "Space Law and the Military Applications of Space Technology", supra note 85 at 484.

[87] *Ibid.*

[88] *Ibid.*

[89] U.S., United States Air Force, *Global Positioning System Fact Sheet, supra* note 27.

[90] *US Air Force Space Operations, supra* note 57 at 36.

during the Vietnam War, the US military also satisfied 15 percent of its communications needs through the lease of commercial satellite capacity.[91]

NATO's air campaign against the Former Yugoslavia (Operation Allied Force) witnessed the first operational use of the Joint Direct Attack Munition (JDAM).[92] The JDAM is a tail-kit attached to a conventional munition, producing a GPS-guided, highly accurate, all weather bombing capability.[93] Over 600 JDAMs were dropped during Operation Allied Force[94] and over 6,000 during the high intensity phase of Operation Iraqi Freedom (OIF) (19 March – 18 April 2003).[95] The US military's use of an upgraded MILSTAR satellite communications system during OIF allowed for the transmission of targeting data in six seconds, reduced from one-hour, as was previously required.[96] The combination of near instantaneous transmission of targeting data through MILSTAR and use of precision-guided munitions (i.e., JDAMs) allowed US forces to mount unprecedented attacks against fleeting and highly mobile targets (i.e., so-called "time sensitive" and "dynamic targets").[97] These space systems also made it increasingly

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[91] Ibid.

[92] U.S., United States Air Force, *Joint Direct Attack Munition GBU-31/32/38 Fact Sheet*, online: <http://www.af.mil/factsheets/factsheet.asp?id=108> (accessed: 1 June 2008).

[93] Federation of American Scientists (FAS), Military Analysis Network, *Joint Direct Attack Munition (JDAM) GBU-29, GBU-30, GBU-31, GBU-32*, online: <http://www.fas.org/man/dod-101/sys/smart/jdam.htm> (accessed: 1 June 2008).

[94] U.S., United States Air Force, *Joint Direct Attack Munition GBU-31/32/38 Fact Sheet*, *supra* note 92.

[95] Michael N. Schmitt, "International Law and Military Operations in Space" (2006) 10 U.N.Y.B. 89, 91.

[96] *Ibid.*
[97] *Ibid.*

"possible to strike the [fleeting and mobile] targets with aircraft that were airborne and often already tasked against other targets."[98]

Operations Allied Force, Iraqi Freedom and Operation Enduring Freedom (Afghanistan) also witnessed the continued and deepening reliance of the US military on commercial satellite telecommunications. During the later stages of Allied Force, the US obtained 60 percent of its satellite communications from commercial providers.[99] During OIF, "military satellite communications did not meet the significant bandwidth requirements of the joint force during major combat operations."[100] As a result, "the military contracted commercial satellite communications to supply nearly 80% of communications during the operation."[101]

Combat operations aside, Intelsat and Americom Government Services, a unit of Luxembourg-based SES, provide as much as 80 percent of the total satellite communications needs of the US military.[102] According to the US Air Force commander responsible for satellite acquisitions, US military demand is now basically double the supply for these systems.[103] The Air Force doctrine governing space operations frankly admits, "[a]s requirements for increased communications bandwidth continue to rise, the US military will continue to seek commercial satellite alternatives to augment our

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[98] *Ibid.*

[99] *US Air Force Space Operations, supra* note 57 at 36.

[100] *Ibid.*

[101] *Ibid.*

[102] Jim Wolf, "Military Space Demands Keep Topping Supply" *Reuters* (9 April 2008), online: <http://www.reuters.com/article/domesticNews/idUSN0935503420080409> (accessed: 24 April 2008).
[103] *Ibid.*

capabilities."[104] The trend of deepening reliance on commercial satellite telecommunications services is clear – US forces initially used these services sporadically for administrative and logistical communications, but now use them to support 80% of their total needs, including during "major combat operations."[105]

This evolution in practice is now firmly rooted in policy. The *US National Space Policy* (2006) requires US government departments and agencies to "[u]se US commercial space capabilities and services to the maximum practical extent [and] purchase commercial capabilities and services when they are available in the commercial marketplace . . . ."[106] Government developed space capabilities are not preferred, and shall be pursued only "when it is in the national interest and there is no suitable, cost-effective US commercial or, as appropriate, foreign commercial service or system that is or will be available when required." [107] Similarly, the *US Commercial Remote Sensing Policy* (2003) provides: "[T]he United States Government will . . . [r]ely to the maximum practical extent on US commercial remote sensing space capabilities for filling imagery and geospatial needs for military, intelligence, foreign policy, homeland security, and civil users." [108] The head of the US National Security Space Office recently noted the

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[104] *US Air Force Space Operations, supra* note 57 at 36.

[105] *Ibid.*

[106] U.S., President of the United States, *U.S. National Space Policy*, National Security Presidential Directive 49, 6 (31 August 2006), online: <http://www.fas.org/irp/offdocs/nspd/space.pdf> (accessed: 8 July 2008) [*US National Space Policy*].

[107] *Ibid.*

[108] U.S., President of the United States, *U.S. Commercial Remote Sensing Policy (Fact Sheet)*, National Security Presidential Directive 27, Section II (25 April 2003), online: <http://www.fas.org/irp/offdocs/nspd/remsens.html> (accessed: 8 July 2008). In addition to satellite telecommunications, the U.S. military also contracts for remote sensing services during armed conflict. The U.S. military purchased exclusive Ikonos satellite imagery rights over Afghanistan from Denver, Colorado based Spaced Imaging, Inc in 2001. The contract took effect on 7 October 2001, the day combat

critical reliance of the US military and intelligence agencies on commercial space capabilities and is initiating steps to cement long-term contractual relationships with commercial satellite telecommunications and remote sensing providers.[109]

Demand for satellite telecommunications and imagery has dramatically increased over time to satisfy the needs of battlefield commanders due largely to the implementation of the concepts of network-centric warfare discussed in the first part of this Chapter. To meet this burgeoning demand, US forces have grown increasingly dependent on private, commercial satellite telecommunications and remote sensing providers as a matter of practice and policy. Assuming this trend of reliance on commercial systems during armed conflict continues and is adopted by other militaries, the status (belligerent or neutral) of States maintaining legal authority over these private, commercial activities will come under increasing scrutiny as belligerents seek to deny satellite services to their opponents in an effort to achieve space and information superiority. The law of neutrality and State responsibility will play an increasingly significant role in properly assessing belligerent and neutral claims and actions. We will analyze these matters in detail in Chapters Four and Five.

C. US Counterspace Doctrine – A Model of How States will Attempt to Deny Enemy Access to Space-Based Support during Armed Conflict

This section will introduce relevant aspects of US space doctrine to illustrate the multi-faceted ways States will seek to achieve space and information superiority during

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operations commenced in Afghanistan. This transaction may have resulted more from a desire of the U.S. military to prevent its adversaries from purchasing the Ikonos imagery than from a dependency on commercial imagery providers. See John J. Lumpkin, "Military Buys Exclusive Rights to Commercial Satellite's Picture of War Zone" *Associated Press* (15 October 2001).

[109] Caitlin Harrington, "Space office plans long-term view for commercial satellite usage" *Jane's Defense Weekly* (28 November 2007) at 8.

armed conflict. As we have seen, the US no longer maintains a monopoly on space capabilities, but it is the only State thus far to promulgate (publicly) a comprehensive doctrine on military space operations. The US efforts in this area will inevitably inform the development of doctrine by other States.

Joint US military doctrine (i.e., doctrine that applies to all branches of the armed services) divides space activities into four broad mission areas: space control, space force enhancement, space force application, and space support.[110] For purposes of our analysis, we will focus on the "space control" and "space force application" missions. In general terms, "space control operations provide freedom of action in space for friendly forces while, when directed, denying it to an adversary, and include the broad aspect of protection of US and US allied space systems and negation of adversary space systems."[111] Basically, "space control missions ensure you have access to space and that the enemy does not."[112]

The space control mission is defensive and offensive in nature and is accomplished through space surveillance[113], protection of US and friendly space systems[114], prevention of hostile use of US or third party space systems/services[115] and

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[110] U.S., Chairman of the Joint Chiefs of Staff, *Joint Doctrine for Space Operations*, *supra* note 85 at IV-1.

[111] *Ibid.* at IV-5.

[112] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 95.

[113] U.S., Chairman of the Joint Chiefs of Staff, *Joint Doctrine for Space Operations*, *supra* note 85 at IV-6 ("Situational awareness is fundamental to the ability to conduct the space control mission. It requires: robust space surveillance for continual awareness of orbiting objects; real-time search and targeting-quality information; threat detection, identification, and location; predictive intelligence analysis of foreign space capability and intent in a geopolitical context; and a global reporting capability for friendly space systems.")

[114] *Ibid.* at IV-7 (defining "protection" as "**[a]ctive and passive defensive measures** ensure that US and friendly space systems perform as designed by overcoming an adversary's attempts to negate friendly exploitation of space or **minimize adverse effects** if negation is attempted . . . . Means of protection

negation. We will focus our analysis on "offensive counterspace operations" (OCS) and in particular, the concept of "negation." Offensive counter-space operations are intended to "preclude an adversary from exploiting space to their advantage."[116] Negation is defined as "measures to deceive, disrupt, deny, degrade, or destroy an adversary's space capabilities."[117] Space capabilities subject to negation include enemy on-orbit satellites, communications links[118], ground stations, launch facilities, command and control systems and potentially, third-party providers.[119] The elements of negation are defined below, and a graphical depiction integrating the various space control mission concepts follows:

> •• **Deception.** Measures designed to **mislead the** adversary by manipulation, distortion, or falsification of evidence to induce the adversary to react in a manner prejudicial to their interests.
>
> •• **Disruption. Temporary impairment** (diminished value or strength) of the utility of space systems, usually without physical damage to the space system. These operations include the delaying of critical, perishable operational data to an adversary.
>
> •• **Denial. Temporary elimination** (total removal) of the utility of an adversary's space systems, usually without physical damage. This objective can be accomplished by such measures as interrupting electrical power to

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include, but are not limited to, ground facility protection (security; covert facilities; camouflage, concealment, and deception; mobility), alternate nodes, spare satellites, link encryption, increased signal strength, adaptable waveforms, satellite radiation hardening and space debris protection measures.") (emphasis in original).

[115] *Ibid.* at IV-7 (defining "prevention" as "measures to preclude an adversary's hostile use of US or third party space systems and services. Prevention can include military, diplomatic, political, and economic measures as appropriate.")

[116] U.S., United States Air Force, *Counterspace Operations*, Air Force Doctrine Document 2.2-1, 31 (2 August 2004), online: Joint Electronic Library <http:www.dtic.mil/doctrine> [*US Air Force Counterspace Operations*].

[117] *Ibid.*

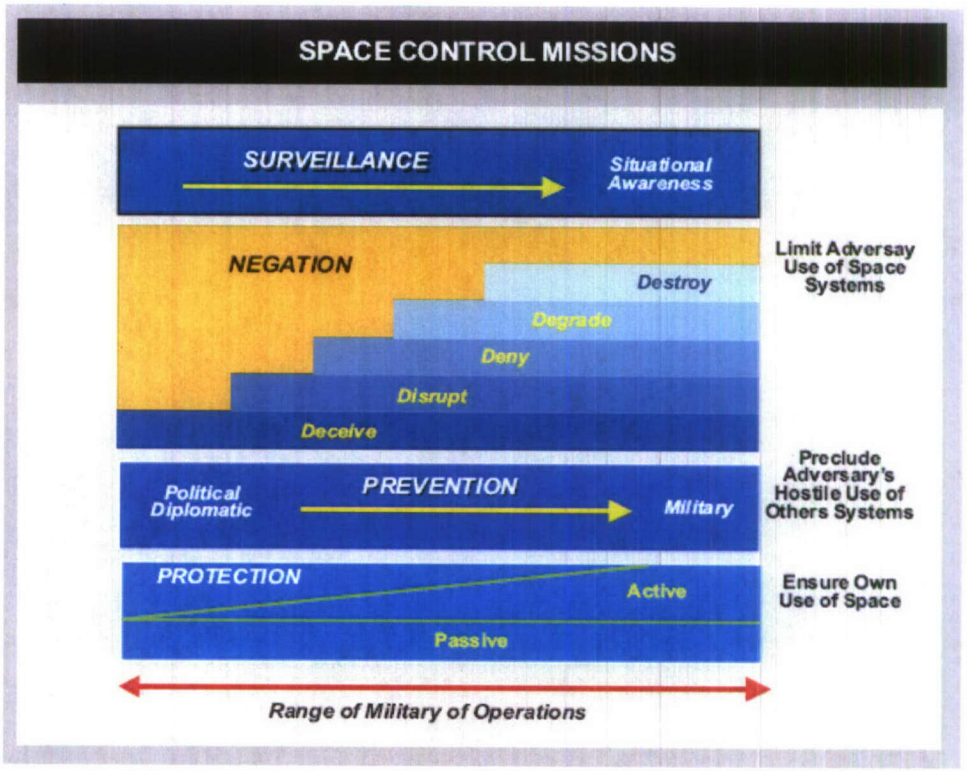
[118] *Ibid.* at 32 ("Space systems are dependent on [radio frequency] and/or laser links to provide communications between space and terrestrial nodes (satellite to ground station or satellite to user), between terrestrial nodes (ground station to users), and between satellites (satellite to satellite))."

[119] *Ibid.* at 32-33.

the space ground nodes or computer centers where data and information are processed and stored. For example, denying US adversaries position navigation information could significantly inhibit their operations.

•• **Degradation. Permanent partial or total impairment** of the utility of space systems, usually with physical damage. This option includes attacking the ground, control, or space segment of any targeted space system. All military options, including special operations, conventional warfare, and information warfare are available for use against space targets.

•• **Destruction. Permanent elimination** of the utility of space systems. This last option includes attack of critical ground nodes; destruction of uplink and downlink facilities, electrical power stations, and tele-communications facilities; and attacks against mobile space elements and on-orbit space assets.[120]



As is readily apparent, the US maintains a broad range of protective, defensive and offensive doctrinal options ranging from the deployment of diplomatic pressure on

[120] All definitions are found in U.S., Chairman of the Joint Chiefs of Staff, *Joint Doctrine for Space Operations*, *supra* note 85 at at IV-7-8 and IV-10 (Figure IV-1 "Space Control Missions").

one end of spectrum to attacks against, and destruction of on-orbit enemy space assets on the other. What resources, weapon systems and forces are available to negate an enemy's space capabilities? Air Force counterspace doctrine provides the following[121]:

> •• **Aircraft.** Friendly aircraft provide nonkinetic and kinetic capabilities against surface targets associated with an adversary's space capabilities. For example, electronic attack platforms (manned and remotely piloted aircraft) could affect the links of an adversary's space system . . . . By attacking terrestrial nodes, aircraft may disrupt, deny, degrade or destroy an adversary's ability to control their satellites or deliver space effects.
>
> •• **Missiles.** Missiles may be employed against a variety of an adversary's space capabilities including launch facilities, ground stations, and space nodes.
>
> •• **Special Operations Forces (SOF).** SOF can conduct direct attacks against terrestrial nodes or provide terminal guidance for attacks against those nodes. Additionally, SOF may be used to provide localized jamming of an adversary's links.
>
> •• **Offensive Counterspace Systems.** These systems are designed specifically for OCS operations, such as a counter satellite communications capability, designed to disrupt satellite-based communications used by an adversary or a counter surveillance reconnaissance capability, designed to impair an adversary's ability to obtain targeting, battle damage assessment, and information by denying their use of satellite imagery with reversible, nondamaging effects.
>
> •• **Antisatellite Weapons (ASATs).** ASATs include direct ascent and co-orbital systems that employ various mechanisms to affect or destroy an on-orbit spacecraft.
>
> •• **Directed Energy Weapons (DEWs).** DEWs, such as lasers, may be land, sea, air, or space based. Depending on the power level used, DEWs are capable of a wide range of effects against on-orbit spacecraft, including: heating, blinding optics, degradation, and destruction. Under certain circumstances, lasers may also be effective against space launch vehicles while in-flight.
>
> •• **Network Warfare Operations.** Many OCS targets, particularly elements of the terrestrial node, may be affected by various [information operations IO)] techniques such as malicious codes, electronic warfare, or [electromagnetic pulse] generators. Some IO techniques afford access to targets that may be inaccessible by other means.
>
> •• **Electronic Warfare Weapons.** [Radio frequency] jammers may be used to disrupt links.

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[121] *US Air Force Counterspace Operations*, *supra* note 116 at 33-34.

•• **C4ISR Systems.**[122] These systems include early warning and surveillance systems, satellites, radar, identification systems, communications systems, and surface-, air-, and space-based sensors. These systems enhance OCS operations by providing early warning, intelligence, targeting, and assessment data, as well as [command and control] of friendly forces.

•• **Surface Forces.** The ability to occupy and secure key areas, as well as the lethality of supporting surface fires, can achieve significant counterspace effects. For example, surface forces can attack a satellite control station in order to disrupt, degrade, or destroy an adversary's space capability.

The intensive media coverage and international political debate surrounding the use of ASATs could potentially mislead one into believing that ASATs are the preferred or sole method for US negation efforts. As is clear from the above, the US (and an increasing number of other States), possess a broad range of negation options, many of which are temporary and reversible (e.g., jamming) or focussed on terrestrial targets (e.g., ground stations). The US has, of course, along with China and the Soviet Union, demonstrated a kinetic anti-satellite capability. In September 1985, the US military successfully tested the Air-Launched Miniature Vehicle (ALMV).[123] This weapon (a heat-seeking miniature homing vehicle) was launched from an F-15 fighter by a small two stage rocket.[124] The homing vehicle destroyed an active US satellite 6.8 feet in diameter, 290 miles above the earth, hitting the satellite within 6 inches of its aim point.[125] The Reagan Administration canceled the ALMV program in 1988 due to technical problems with the homing guidance system, as well as testing delays and

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[122] Command, Control, Communication, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems. See *Ibid.* at 32-33.

[123] *Air-Launched Miniature Vehicle (AMLV)*, GlobalSecurity.org, online: <http://www.globalsecurity.org/space/systems/almv.htm> (accessed: 24 April 2008).

[124] *Ibid.*

[125] *Ibid.*

significant cost growth.[126] More recently, on 20 February 2008, a US Navy AEGIS warship fired a single modified tactical Standard Missile-3, hitting a non-functioning National Reconnaissance Office satellite approximately 153 miles over the Pacific Ocean.[127] The stated objective was safety-related - to rupture the fuel tank of the satellite to dissipate the approximately 1,000 pounds of hydrazine before the satellite entered the earth's atmosphere.[128] The Standard Missile-3 was modified to complete this mission – its primary purpose is to support the sea-based Aegis Ballistic Missile Defense system.[129]

Media and political portrayals notwithstanding, ASATs are largely disfavored in the US military, except as "a last ditch effort" according to former commander of US Space Command, General Ralph Eberhart.[130] Why is this? In addition to the political sensitivity of the weaponization debate, the answer lies in enlightened self-interest. Experts estimate that China's January 2007 anti-satellite test added more than 2 million pieces of debris in low-Earth orbit.[131] Because the destroyed Chinese satellite was 530 miles above Earth, the debris is expected to remain in space for hundreds of years.[132]

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[126] *Ibid.*

[127] "Navy Missile Hits Decaying Satellite Over Pacific Ocean" Armed Forces Press Release (20 February 2008), online: <http://www.defenselink.mil/news/newsarticle.aspx?id=49024> (accessed: 8 July 2008).

[128] *Ibid.*

[129] U.S., Missile Defense Agency, *BMD Basics – Midcourse Phase Defense*, online: <http://www.mda.mil/mdalink/html/midcrse.html> (accessed: 24 April 2008).

[130] Charles Aldinger, "General Warns: High-Tech Warfare Could Litter Space with Debris" *Space.Com* (28 March 2001), quoted in, Mike Moore, *Twilight War – The Folly of U.S. Space Dominance* (The Independent Institute, 2008) at 77.

[131] John Johnson Jr., "Space Debris Causing Worries: Scientists Fear a Chain Reaction After Chinese Test Left 2 Million Shards in Orbit" *Los Angeles Times* (15 April 2008), online: <http://www.chron.com/disp/story.mpl/nation/5704118.html> (accessed: 24 April 2008).

[132] *Ibid.*

Experts estimate there are over 150 million pieces of debris (most less than 2 inches across) in orbit around the Earth.[133] They suggest this amount will increase by a factor of three (3) in the next 200 years because of fragmentation from collisions between debris (i.e., the so-called "cascading effect").[134] Confining the effects of this debris may well prove impossible. An increase in space debris will clearly jeopardize on-orbit assets and may ultimately alter and severely limit use of low-Earth orbit. Adding to the debris population only serves to undermine the US military's stated goal of "freedom of action in space."[135] Indeed, General Eberhart noted debris as his primary concern in utilizing kinetic anti-satellite weapons[136], and stated he "would much rather interfere with the [satellite's] uplinks and downlinks – I would much rather . . . bomb a ground station."[137]

The above analysis suggests that the US, and most likely all other space-faring States, will pursue non-kinetic temporary and reversible negation measures as initial, preferred options in future armed conflicts. Indeed, the recent US Air Force Transformation Plan appears to adopt this approach, noting that "[f]or a variety of reasons, the Joint Forces Commander will generally approach space control negation options (i.e., deception, disruption, denial, degradation and destruction) in ascending

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[133] *Ibid.*

[134] *Ibid.*

[135] *U.S. National Space Policy*, *supra* note 106 at 1.

[136] Aldinger, "General Warns: High-Tech Warfare Could Litter Space with Debris", *supra* note 130. The General said, "First and foremost, I'm concerned about the debris in space and not knowing what's going to happen once you blow it [a satellite] up . . . . I have to admit that I would also be concerned about the threshold that you cross if you do that . . . what it might mean in terms of weapons in space and other space activities."

[137] *Ibid.*

order."[138] Given the legal constraints discussed in Chapters Three and Five below, this will hold especially true when a belligerent State seeks to deny enemy use of a civilian "dual use" satellite, or one belonging to a neutral State. While not ruling out the use of ASATs, States will most likely reserve them as a last option because of the political sensitivity of the weaponization debate, and more importantly perhaps, because of resulting space debris.

[138] U.S., United States Air Force, *The United States Air Force Transformation Flight Plan* (November 2003), at D-22.

Chapter Three: International Law Governing Outer Space Military Operations

Before beginning our analysis of the law of neutrality, we must first appreciate where it fits in with respect to the larger scheme of international law governing (1) military activities in outer space, (2) resort to the use of force (*jus ad bellum*) under the *UN Charter*, and (3) the limitations on the use of force applicable once international armed conflict has commenced (*jus in bello*). This chapter will provide a brief overview of conventional and customary international law in these three areas with particular emphasis on the status of neutral States where appropriate.

A. Treaty Law Governing Military Activities in Outer Space

The foundational treaty governing space law is the 1967 *Outer Space Treaty*.[139] The preamble of the Treaty makes two references to the proposition that the exploration and use of outer space should be pursued for "peaceful purposes."[140] Some commentators have asserted that "peaceful" should be interpreted to mean "non-military" while others have suggested that it simply means "non-aggressive or non-hostile."[141] The US has consistently adopted the latter position[142] and State practice[143] appears to support

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[139] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 610 U.N.T.S. 205, 18 U.S.T. 2410. (1967) [*Outer Space Treaty*]

[140] *Ibid.* at prmbl., paras. 2, 4.

[141] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 101.

[142] *US Air Force Space Operations, supra* note 57 at 27 ("The majority of nations have traditionally held that the 'peaceful purposes' language does not prohibit military activities in outer space; such activities have taken place throughout the space age without significant international protest.")

[143] In accordance with Article 31(3)(b) of the *Vienna Convention on the Law of Treaties*, treaty interpretation shall "take into account . . . any subsequent practice in the application of the treaty which

that position. As one commentator has asserted, "[t]oday, space is used regularly for military purposes ranging from intelligence gathering to communications, usually without protest. Even ill-equipped armed forces rely on such commercially available space-dependent products as mobile phones and GPS locators."[144]

What does "non-aggressive or non-hostile" mean? According to current US space doctrine, the phrase means that military operations in space must be "in compliance with the requirements under the United Nations Charter and international law to refrain from the threat or use of force except in accordance with the law, such as in self-defense or pursuant to United Nations Security Council authorization."[145] This interpretation is supported by Article III of the *Outer Space Treaty*, which provides that "State parties to the Treaty shall carry on activities in the exploration and use of outer space . . . in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding."

Assuming this interpretation is correct, it is important to note that Article III does not ban the use of force or attacks against space based assets. The use of force in question could be lawful under an exception to the *UN Charter*'s prohibition on the threat or use of force (e.g., self-defense under Article 51 or UN Security Council authorization under Chapter VII/Article 42). We will discuss the *UN Charter* in more detail below – for present purposes, however, it is sufficient to note that there is no general prohibition

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establishes the agreement of the parties regarding its interpretation." *Vienna Convention on the Law of Treaties,* 23 May 1969, 1155 U.N.T.S. 331.

[144] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 101-02.

[145] *US Air Force Space Operations, supra* note 57 at 27.

on the use of force in outer space if that use is otherwise lawful under the *UN Charter* and other provisions of international law discussed below.

Although the *Outer Space Treaty* contains no general prohibition on the use of force in outer space, the Treaty and other international law do contain some noteworthy limitations. Most significantly perhaps is Article IX of the *Outer Space Treaty*, which obligates State parties to demonstrate "due regard to the corresponding interests of all other State parties" in the course of their exploration and use of outer space.[146] The US Department of Defense Office of General Counsel has opined that the "due regard" principle is "so widely accepted that [it is] generally regarded as constituting binding customary international law, even for non-parties to the [*Outer Space Treaty*]."[147]

Article IX also requires State parties to "avoid . . . harmful contamination" of outer space and "undertake appropriate international consultations" prior to taking any actions that "would cause potentially harmful interference with activities of other State parties in the peaceful exploration and use of outer space . . . ."[148] Although "harmful interference" is not defined, the phrase is qualified by the requirement that the "other State parties" affected are using space for "peaceful" purposes. If this is not the case, the space system(s) of the "other State parties" may be subject to interference and/or attack under appropriate circumstances, for example in self-defense under the *UN Charter*, or during international armed conflict if the space system constitutes a valid military objective under the law of armed conflict.

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[146] *Outer Space Treaty,* supra note 139, art. IX.

[147] U.S., Department of Defense, Office of General Counsel, *An Assessment of International Legal Issues in Information Operations* (2nd ed., 1999) at 493.

[148] *Outer Space Treaty, supra* note 139, art. IX.

Assuming Article IX applies during international armed conflict[149], if an attack could potentially impact neutral States (e.g., through the creation of space debris, or if the target satellite belongs to a neutral State), the provision requires "appropriate international consultations" with those neutral parties prior to attack. The requirement for consultations, however, merely imposes a duty to negotiate in good faith -- it does not mandate that the parties reach a mutually agreeable solution. As will see in Chapter Five, belligerent States retain forcible options under the law of neutrality and armed conflict to prevent enemy use of neutral space capabilities.

Other specific treaty limitations on military operations and the use of force in outer space can been summarized as follows: [150]

(1) Prohibition on placing nuclear weapons in Earth orbit, on celestial bodies, or anywhere else in outer space (*Outer Space Treaty*, Article IV, para. 1);

(2) Prohibition on placing weapons of mass destruction in Earth orbit, on celestial bodies, or anywhere in outer space (*Outer Space Treaty*, Article IV, para. 2);

(3) Prohibition on establishing a military base or installation on the moon or other celestial bodies (*Outer Space Treaty*, Article IV, para. 2);

(4) Prohibition on testing of any weapons on the moon or other celestial bodies (*Outer Space Treaty*, Article IV, para. 2);

(5) Prohibition on conducting military maneuvers on the moon or other celestial bodies (*Outer Space Treaty*, Article IV, para. 2);

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[149] Historically, treaty obligations between belligerents were suspended during armed conflict between them – in modern practice however, the appropriateness of suspension of obligations is assessed on a case-by-case basis to determine whether the object and purpose of particular treaty provisions at issue are consistent with a state of hostilities. For traditional/historical practice, see 2 *Oppenheim's International Law: A Treatise*, 302 (London: H. Lauterpacht ed., 7th ed., 1952). For modern practice, see *Restatement (Third), Foreign Relations Law of the United States*, sec. 336, Reporter's Notes, 221-22 (St. Paul, MN: American Law Institute, 1987).

[150] Summary contained in Douglas S. Anderson and Christopher R. Dooley, "Information Operations in the Space Law Arena" 304, note 88, *in Computer Network Attack and International Law*, International Law Studies, Vol. 76 (Newport R.I.: Naval War College, 2002).

(6) Prohibition on conducting nuclear weapons explosions in outer space (Limited Test Ban Treaty, Article I.1(a));

(7) Prohibition on military or hostile use of environmental modification techniques that could produce widespread adverse effect in either the Earth's atmosphere or outer space (Environmental Modification Convention, Articles I and II).

An additional area of treaty law is relevant to our analysis. The International Telecommunication Union (ITU) Constitution[151] provides guidance with respect to the use of the radio frequency spectrum for satellite up-link, down-link and telemetry transmissions. As discussed in Chapter Two above, States will almost certainly rely on non-kinetic methods of negation using the radio frequency spectrum as a primary option during armed conflict.

Article 45(1) of the Constitution provides that all telecommunications stations "must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Member States."[152] "Harmful interference" is defined as "interference which endangers the functioning of a radio-navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio-communication service operating in accordance with the Radio Regulations."[153] However, Article 48(1) and (2) of the Constitution provide a significant exception in that "[m]ember States retain their entire freedom with regard to military . . . installations . . . nevertheless, these installations must, so far as possible,

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[151] *Constitution of the International Telecommunication Union*, as adopted in Geneva in 1992 and amended by the Plenipotentiary Conference at Kyoto in 1994, available at < http://www.itu.int/aboutitu/basic-texts/constitution.html> (accessed: 24 April 2008) (*ITU Constitution*).

[152] *Ibid.* at art. 45(1).

[153] *Ibid.* at Annex, para. 1003, quoted in Anderson and Dooley, "Information Operations in the Space Law Arena" *supra* note 150 at 284, note 125.

observe . . . the measures to be taken to prevent harmful interference . . . ."[154] Inclusion of the phrases "entire freedom" and "so far as possible" in Article 48 clearly suggests that military exigency or necessity (e.g., measures taken during armed conflict) may override the obligation to prevent harmful interference.[155]

While the military exception is unlikely to raise significant legal concerns regarding interference measures imposed by one belligerent military installation against another, it is unclear whether the language and scope of Articles 45 and 48 extend to protect neutral space systems against belligerent interference during periods of international armed conflict. Be that as it may, however, this scenario is not ultimately governed by Articles 45 and 48 --interference measures taken in the context of international armed conflict must be analyzed under the *lex specialis* – namely, the law of armed conflict (e.g., rules on legitimate targets and proportionality), the law of neutrality, and possibly the law of undersea cable cutting, contraband and blockade. We will discuss the general principles underlying the law of armed conflict below before proceeding with an analysis of the law of neutrality, undersea cable cutting, contraband and blockade in Chapter Five.

B. Law Governing the Resort to the use of Force – Jus ad Bellum under the *UN Charter*

Under international law, the use of force by States "is always judged twice, first with reference to the reasons [they] have for fighting, secondly with reference to the

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[154] *ITU Constitution*, *supra* note 151, art. 48.

[155] According to one prominent scholar, "[d]espite the exemption [Article 48(1) and (2)], most states abide by ITU guidelines as a matter of policy when conducting their military operations." Schmitt, "International Law and Military Operations in Space", supra note 95 at 113. Schmitt notes that the U.S. has adopted a "due regard" standard for its own forces. See U.S., Department of Defense, *Management and Use of the Radio Frequency Spectrum*, DoD Directive 4650.1, para. 4.3.3 (8 June 2004).

means they adopt."[156] The legal regime governing a State's resort to the use of force in the first instance is known as *jus ad bellum*, and is most authoritatively expressed in Article 2(4) and Article 51 of the United Nations Charter. In contrast, "[t]he laws of war, or *jus in bello*, are those rules and principles of international law . . . which govern the conduct of war" once it has commenced.[157] While these two bodies of law are obviously related, they are conceptually distinct and subject to the "cardinal principle that *jus in bello* applies in cases of armed conflict whether the conflict is lawful or unlawful in its inception under *jus ad bellum*."[158]

The substance of *Jus ad Bellum* is set forth in the *UN Charter*. Forged in the wake of the destruction of World War II, the *UN Charter* established the United Nations principally as a means by which "[t]o maintain international peace and security."[159] Paramount to achieving this goal is the Charter's general prohibition of the threat or use of force as a means of conflict resolution between States.[160] This prohibition constitutes

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[156] Michael Walzer, *Just and Unjust Wars: A Moral Argument with Historical Illustrations* 21 (New York: Basic Books, 2d. ed., 1977).

[157] Frtiz Kalshoven, "Laws of War", *in* 4 *Encyclopedia of Public international Law* 316 (Bernhardt, ed, 1982). See also, Major Robert A. Ramey, USAF, *Armed Conflict on the Final Frontier: The Law of War in Space*, 48 A.F. Law Rev. 1, 33 (2000).

[158] Adam Roberts & Richard Guelff, eds., *Introduction to Documents on the Laws of War*, 1 (Oxford: Oxford University Press, 1989). See also Christopher Greenwood, "Historical Development and Legal Basis" *in The Handbook of Humanitarian Law in Armed Conflict* 1, 10 (Oxford: Oxford University Press, Dieter Fleck, ed., 1995) ("[t]oday humanitarian law is applicable in any international armed conflict, even if the parties to that conflict have not declared war and do not recognize that they are in a formal state of war"). Greenwood's use of the phrase "international humanitarian law" is intended to be synonymous with the older phrase "law of war" or more recent "law of armed conflict" – this law is "designed to regulate the treatment of the individual-civilian or military, wounded or active-as well as rules governing the means and methods of warfare. Though related, the law of neutrality is distinct. Robert A. Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space" 48 A.F.L. Rev. 1, 32, note 133 (2000).

[159] *Charter of the United Nations*, art 1(1), 26 June 1945, 59 Stat. 1031, T.S. 933, 3 Bevans 1153.

[160] *Ibid.* at art. 2(4).

"the cornerstone of modern international law."[161] The International Law Commission has identified the prohibition as a "conspicuous example of *jus cogens*"[162] and the Commission's position was cited by the International Court of Justice (ICJ) in the 1986 *Nicaragua* case.[163] The paramount importance of this norm stems from the conviction of the leading States following World War II that the refusal of Germany and Japan to respect international borders was the direct cause of the war.[164] The goal of the leading States after the War was "to construct international institutions that would prevent future erosion of sovereignty by making unilateral intervention illegitimate."[165]

Article 2(3) of the Charter establishes the general norm requiring peaceful resolution of disputes, providing that "[a]ll Members shall settle their international disputes by peaceful means in such a manner that international peace and security, and justice are not endangered."[166] Article 2(4) provides "[a]ll Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations." According to one prominent commentator, "[t]he correct

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[161] Yoram Dinstein, "Computer Network Attacks and Self-Defense" *in Computer Network Attack and International Law*, International Law Studies, Vol. 76, 9 (Newport R.I.: Naval War College, 2002).

[162] *Report of the International Law Commission*, 18th Session, (1966) II Yearbook of the International Law Commission 172, 247.

[163] See *Military and Paramilitary Activities in and against Nicaragua* (Nicaragua v. United States), [1986] I.C.J. 14, 96-97.

[164] Frank Gibson Goldman, *The International Legal Ramifications of United States Counter-Proliferation Strategy: Problems and Prospects* (Newport R.I.: Naval War College Press, 1997) at 12.

[165] *Ibid.*

[166] See also *Charter of the United Nations*, *supra* note 159, art. 33 ("The Parties to any dispute, the continuance of which is likely to endanger the maintenance of international peace and security, shall, first of all, seek a solution by negotiation, enquiry, mediation, conciliation, arbitration, judicial settlement, resort to regional agencies or arrangements, or other peaceful means of their own choice.").

interpretation of Article 2(4) . . . subsequent to the *Nicaragua* Judgement is that there exists in international law today 'an absolute prohibition on the use or threat of force, subject only to the exceptions stated in the Charter itself.'"[167]

The only two exceptions to the general prohibition of the threat or use of force are collective security measures taken by the UN Security Council pursuant to Article 42 and individual and collective self-defense in accordance with Article 51. The Security Council's collective security authority is rooted in Article 39, which requires the Council to "determine the existence of any threat to the peace, breach of the peace, or act of aggression and . . . make recommendations, or decide what measures shall be taken in accordance with Articles 41 and 42, to maintain or restore international peace and security."

Article 41 authorizes the Security Council to employ measures "not involving the use of armed force" including, but not limited to, "complete or partial interruption of . . . telegraphic, radio, and other means of communication . . . ." Article 42 provides:

> Should the Security Council consider that measures provided for in Article 41would be inadequate or have proved to be inadequate, it may take such action by air, sea, or land forces as may be necessary to maintain or restore international peace and security. Such action may include demonstrations, blockade, and other operations by air, sea, or land forces of Members of the United Nations.

The second exception to the general prohibition of the use or threat of force is individual and collective self-defense pursuant to Article 51 of the Charter. Article 51 provides:

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[167] Dinstein, "Computer Network Attacks and Self-Defense", supra note 161 at 99 quoting J. Mrazek, "Prohibition of the Use and Threat of Force: Self-Defense and Self-Help in International Law" (1989) 27 Can Y.B. of Int'l L. 81, 90.

> Nothing in the Present Charter shall impair the inherent right of Individual or collective self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defense shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in or to maintain or restore international peace and security.

Despite the normative power of the general prohibition of the threat or use of force, State practice and the passage of time have given rise to significant questions regarding the scope and application of Article 2(4) and Article 51. Does Article 51 foreclose the customary international law principle of preemptive self-defense? What measures constitute "use of force" under Article 2(4) and/or an "armed attack" under Article 51? Is there a minimal threshold of force under Articles 2(4) and 51? Can a non-kinetic attack constitute an "armed attack" triggering the right to self-defense under Article 51? This question in particular is receiving increasing attention, as demonstrated by the US, NATO and EU response to recent cyber-attacks in Estonia.[168] As the law of

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[168] Beginning in April 2007, the State of Estonia, a pioneer in the development of e-government and member of NATO, suffered "a wave of Distributed Denial of Service [cyber] attacks [that] swamped Estonian Web sites by overwhelming the bandwidth of the servers." Tech. Sgt. A.J. Bosker, "Offutt Air Force Base_SECAF: Dominance in cyberspace is not optional" *U.S. Air Force 55th Wing Public Affairs* (31 May 2007), online: < http://www.estemb.org/press/us_media/aid-713> (accessed: 24 April 2008). According to the U.S. Secretary of the Air Force, Michael W. Wynne, "The Russians have denied that this was their action, contrary to all the evidence . . . [h]owever, the good news is the attacks didn't shut down this small country. But it did start a series of debates within NATO and the EU about the definition of clear military action and it may be the first test of the applicability of Article V of the NATO charter regarding collective self-defense in the non-kinetic realm." *Ibid.* Article V of the NATO Treaty provides:

> The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defence recognized by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic area.

neutrality applies between belligerents and neutrals once international armed conflict has commenced, analysis of these questions is beyond the scope of this thesis. These questions, however, will assume greater importance as warfare evolves into an increasingly information-based, network-centric endeavour involving non-kinetic measures using the radio frequency spectrum.

C. *Jus in Bello* – Law of Armed Conflict and Military Operations in Outer Space

Dating back to the ancient civilizations of India and Egypt, humankind has endeavored to minimize and alleviate the sufferings of war through agreements and treaties, works of religious authorities and philosophers, articles of war promulgated by military leaders and rules of chivalry.[169] The ICJ has noted that the "fundamental principle[]" underlying this law is "to mitigate and circumscribe the cruelty of war for humanitarian purposes."[170] Scholars have noted numerous additional reasons for the creation and development of the international law of armed conflict – diminishing the moral depravation of soldiers, lessening the dangers that threaten the survival of civilization and humankind, favorably impacting the peacetime creation of doctrine and weapons, furthering the cause of disarmament by prohibition of certain weapons,

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> Any such armed attack and all measures taken as a result thereof shall immediately be reported to the Security Council. Such measures shall be terminated when the Security Council has taken the measures necessary to restore and maintain international peace and security.
>
> *North Atlantic Treaty*, Apr. 4, 1949, 63 Stat. 2241, 34 U.N.T.S. 243.

[169] A.P.V. Rogers, *Law on the Battlefield*, 1 (Manchester: Manchester University Press, 1996), citing I. Detter de Lupis, *The Law of War*, 121-23 (Cambridge: Cambridge Press, 1987). International law scholars of the Enlightenment era such as Hugo Grotius and E. De Vattel played an instrumental role in laying the foundation of the modern law of armed conflict. *Ibid.*

[170] *Legality of the Threat or Use of Nuclear Weapons Case*, Advisory Opinion, [1996] I.C.J. Rep. 226. [*Nuclear Weapons Case*].

increasing chances for the restoration of peace after termination of hostilities, and enhancing military efficiency by requiring the focused application of force.[171]

While conceptually distinct, the "law of neutrality compliments this body of law by structuring the legal relationship between belligerent and non-belligerent States"[172] with the ultimate end of mitigating the effects of combat. As we will see in Chapter Five, the law of armed conflict shapes and limits belligerent and neutral actions designed to vindicate their respective rights and obligations under the law of neutrality. Noting the evolutionary character of the law of neutrality and its close relationship to the law of armed conflict, the ICJ has stated:

> The Court finds that as in the case of the principles of humanitarian law applicable in armed conflict, international law leaves no doubt that the principles of neutrality, whatever its content, which is of a fundamental character similar to that of the humanitarian principles and rules is applicable (subject to relevant provisions of the United Nations Charter), to all international armed conflict whatever type of weapons might be used.[173]

The modern-day *jus in bello* framework governing the conduct of warfare is primarily found in two treaties, the 1907 *Hague Convention (IV) respecting the Laws and Customs of War on Land* and the 1977 *Additional Protocol I to the 1949 Geneva Conventions* (hereinafter *Hague IV*).[174] The ICJ has concluded that the *Hague IV*

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[171] Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space", supra note 157 at 28, citing B.V.A. Roling, "The Significance of the Laws of War", in *Current Problems in International Law: Essays on UN Law and on the Law of Armed Conflict,* 133 (Milano: A.G. Giuffre, A. Cassese, ed., 1975).

[172] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 211.

[173] *Nuclear Weapons Case, supra* note 170 at para. 89.

[174] *Regulations respecting the Laws and Customs of War on Land, Annex to Convention (IV) Respecting the Laws and Customs of War on Land*, 18 October 1907, 36 Stat. 2295; *Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts.*

provisions "are to be observed by all States whether or not they have ratified the conventions that contain them, because they constitute intransgressible principles of international customary law."[175] By its title and scope, however, *Hague IV* applies only to land warfare. In accordance with Article 49.3, *Additional Protocol I* applies "to any land, air or sea warfare which may affect the civilian population, individual civilians or civilian objects on land . . . ."[176] Although "space" is not expressly included in this definition, a functional interpretation covering all conduct of warfare "affect[ing] the civilian population on land" is arguably appropriate.[177]

Although there are no treaties establishing specific *jus in bello* principles for warfare conducted in, from, and through outer space, a "near universal concurrence exists that customary principles [of the law of armed conflict] . . . apply regardless of the situs of battle"[178] to include outer space.[179] Synthesizing customary rules such as "distinction" and "proportionality" with principles set forth in *Additional Protocol I*, one author succinctly notes that "attacks [in, from, and through outer space] may only be conducted against military objectives and they must comply with the principle of proportionality . . .

(Protocol I), 8 June 1977, UNTS Vol. 1125 No. 17512, ILM 16 (1977), 1391 et seq. [*Protocol I to the Geneva Conventions*].

[175] *Nuclear Weapons Case, supra* note 170 at, para. 79.

[176] *Protocol I to the Geneva Conventions*, *supra* note 174.

[177] See Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 115 ("the most reasonable interpretation is that the Protocol encompasses space-based attacks against land targets [and] . . . attacks against space-based assets (whatever the source) that would affect the civilian population (for instance, by interfering with emergency response communications").

[178] *Ibid.* at 116.

[179] See, e.g., Ramey, "Armed Conflict on the Final Frontier: The Law of War in Space" *supra* note 157 at 35 ("[b]ecause there are no treaties establishing specific *jus in bello* principles for space combat . . . customary principles provide the most authoritative source . . . on which an analysis of a *jus in bello* for space must proceed"); Bourbonniere, "The Ambit of the Law of Neutrality and Space Security" *supra* note 3 at 211 ("[t]he fact that space military capabilities have been developed after most of the principles and rules of international humanitarian law had already come into existence cannot justify the exclusion of military activities in outer space from these rules").

[a] further requirement is the taking of precautions to avoid mistaken attacks and to minimize collateral damage to civilians objects and incidental injury to civilians."[180] We will briefly review these concepts as applied to belligerent space activities.

As a threshold matter, a belligerent's actions must constitute an "attack" in order to fall within the parameters of the laws governing the conduct of warfare. "Attack" is a term of art defined as an "act[] of violence against the adversary, whether in offence or defence."[181] This definition includes "non-kinetic operations that cause damage or destruction to civilian objects or injury to, or death of, civilians."[182] Belligerent actions causing mere inconvenience or non-injurious hardship would not constitute an attack.[183] This threshold requirement is significant in the context of the counter-space negation measures discussed in Chapter Two because States will seek to employ temporary, reversible non-kinetic measures as one option (e.g., localized jamming/blocking of signals) in an effort to avoid creation of debris. If their actions do not rise to the level of an attack, belligerents may also feel less restrained in taking negation measures against neutral satellites, perhaps in the form of lawful counter-measures against perceived unneutral service to an enemy, or as lawful contraband or blockade enforcement measures.[184]

Continuing with our discussion of the scheme of customary international law of armed conflict, "military objectives" are "those objects which by their nature, location,

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[180] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 120.

[181] *Protocol I to the Geneva Conventions*, *supra* note 174, art. 49.1.

[182] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 117.

[183] *Ibid.* at 117, citing Michael N. Schmitt, "Wired Warfare: Computer Network Attack and International Law" Int'l Rev. of the Red Cross 84 (2002).

[184] See *infra* Chapter Six.

purpose or use make an effective contribution to military action and whose total or partial destruction, capture or neutralization, in the circumstances ruling at the time, offers a definite military advantage."[185] By their "nature" all military satellites are military objectives. This includes military satellites used for civilian purposes, such as the GPS constellation.[186] Civilian satellites providing services to the military (i.e., "dual use" capabilities) qualify under the "use" criterion (e.g., commercial communications and remote sensing satellites providing contracted services to belligerents during armed conflict). Determining the "purpose" of a satellite can be difficult, and will typically require close monitoring of its activity. One author notes, for example, "[a]s the common, integral remote sensing technology base grows, it is becoming increasingly difficult to differentiate between military and civilian technologies . . . it is only when a technology is put to use that an ad hoc specification is possible . . . the dual use notion, therefore, cannot be related to the nature of a specific technology, but depends on circumstantial employment and prevailing policy assessment . . . ."[187] The last criterion of "location" applies to "objects which by their nature have no military function but which, by virtue of their location, make an effective contribution to military action."[188] Similar to bombing a mountain pass to prevent enemy access, a belligerent may "place space debris into a particular orbit or cause an explosion at a specific point in space to deprive the enemy use at a certain moment (e.g., when they want to secretly reposition

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[185] *Protocol I to the Geneva Conventions*, *supra* note 174, art. 52.2.

[186] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 116.

[187] Wulf von Kries, "Towards a New Remote Sensing Order" (2000) 16 Space Policy 163, 164.

[188] Y. Sandoz/ C. Swinarski/ B. Zimmerman (eds.), Commentary on the Additional Protocols of 8 June 1977 to the Geneva Conventions of 12 August 1949, 1987, para. 2021.

forces."[189] Such an action, of course, would be subject to other principles of law, such as "proportionality" as discussed below and potentially Article IX of the *Outer Space Treaty*.

The "proportionality" principle prohibits "an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated."[190] Proportionality will assume particular significance in space for several reasons. As we saw in Chapter Two, militaries (in particular the US) are relying increasingly on commercial civilian telecommunications and remote sensing satellite services during armed conflict, making these satellites "dual use" and therefore subject to attack. Conversely, military satellites such as the GPS constellation have significant civil applications. As a preview of the vulnerabilities inherent in widespread civilian reliance on GPS, a programming error made by a US Air Force GPS satellite controller in 1996 is instructive. The controller accidentally inputted the wrong time into one of the constellation's 24 satellites.[191] According to a prominent United States Air Force General involved in US military space activities:

> The erroneous time was broadcast for only six seconds before automatic systems detected it and shut the satellite signal down. Nonetheless, over one hundred of the more than eight hundred cellular telephone networks on the US East Coast – which rely on precise GPS-provided timing – failed. Some took hours and even days to recover.[192]

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[189] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 117.

[190] *Protocol I to the Geneva Conventions*, *supra* note 174, arts. 51.5(b), 57.2(a)(iii), and 57.2(b).

[191] Lt Gen Bruce Carlson, "Protecting Global Utilities: Safeguarding the Next Millenium's Space-Based Public Services" (Summer 2000) Aerospace Power Journal at 37.

[192] *Ibid.*

Assessing the potential direct and indirect civilian damage, loss of life and injury resulting from an attack on a dual use satellite will certainly prove difficult, not to mention the difficulty in attempting to balance these losses against an anticipated "concrete and direct military advantage." Another significant facet of proportionality is the creation of debris resulting from an ASAT attack. As we saw in Chapter Two, anticipating the long term impact of space debris may well prove impossible in some instances, creating a decades-long potential for damage to civilian objects. The long-term potential for damage creates a corresponding long-term potential for legal exposure under the laws of armed conflict.

The final law of armed conflict concepts we will discuss are belligerent duties to take precautions to "avoid mistaken attacks and to minimize collateral damage to civilian objects and incidental injury to civilians."[193] With respect to avoiding mistaken attacks, *Additional Protocol I*, Article 57.2(a)(i) requires a belligerent to do "everything feasible to verify that the objectives to be attacked are [not] . . . civilian objects." As we will see, the notification provisions of the *Registration Convention*[194] will prove useful in achieving compliance with this requirement. With respect to minimizing harm to civilians and civilian objects, belligerents are required to "take all feasible precautions in the choice of means and methods of attack with a view to avoiding, and in any event to minimizing" such harm.[195] With reference again to space debris, an attacker may be required to employ a non-kinetic negation measure in lieu of a kinetic measure if the

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[193] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 117, citing *Protocol I to the Geneva Conventions*, *supra* note 174, art. 57.

[194] *Convention on the Registration of Objects Launched into Outer Space*, 14 January 1975, 1023 U.N.T.S. 15, 28 U.S.T. 695 [*Registration Convention*].

[195] *Protocol I to the Geneva Conventions*, *supra* note 174, art. 57.2(a)(ii).

former would result in less collateral damage while resulting in a similar military advantage.[196] A related provision provides "[w]hen a choice is possible between several military objectives for obtaining military advantage, the object to be selected shall be that the attack on which may be expected to cause the least danger to civilian lives and to civilian objects."[197] One author provides the following example illustrating the application of this principle – "if a satellite can be reliably neutralized through a strike on a ground-based control node in a remote area, it would not be permissible to attack the satellite kinetically and thereby create dangerous space debris."[198]

[196] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 120.

[197] *Protocol I to the Geneva Conventions*, *supra* note 174, art. 57.3.

[198] Schmitt, "International Law and Military Operations in Space", *supra* note 95 at 121.

Chapter Four: State Responsibility for Outer Space Activities

Before examining the respective rights and duties of neutrals and belligerents during international armed conflict, we must first identify and analyze the legal principles relevant in determining State responsibility and jurisdiction and control with respect to the operation of satellites. As the number of States and commercial actors in space continue to rise and militaries grow more dependent on space applications during armed conflict, it will become increasingly important to clearly define and delineate the status and relative roles and responsibilities of States in outer space. A proper understanding of these matters will facilitate the resolution of belligerent and neutral claims and may therefore ultimately serve to mitigate the impact and/or spread of a particular armed conflict.

As stated in the Commentary to the *International Law Commission's Articles on State Responsibility*, "the general rule is the only conduct attributed to the State at the international level is that of its organs of government, or of others who have acted under the direction, instigation or control of those organs, i.e., as agents of the State."[199] A corollary to this principle is "the conduct of private persons is not as such attributable to the State."[200] If these general principles applied in the context of outer space activities, the activities of private, commercial satellite service providers would not be attributable to States. This is not the case, however, as Article VI of the *Outer Space Treaty*

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[199] James Crawford, *The International Law Commission's Articles on State Responsibility – Introduction, Text and Commentaries*, 91 (Cambridge: Cambridge University Press, 2002).

[200] *Ibid.*

embodies a "fundamental innovation" in the law of State responsibility.[201] Article VI provides:

> States Parties to the Treaty shall be international responsibility for national activities in outer space . . . whether such activities are carried on by Governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space . . . shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space . . . by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the State Parties to the Treaty participating in such organization.

The practical effect of this language is that contracting States assume "direct State responsibility for non-governmental space activities" including activities by private, commercial outer space actors.[202] While this principle is easy enough to state and understand in theory, it is much more difficult to apply in practice, especially when multiple States are increasingly involved in some form or another in a given outer space activity.[203] For example, who is the "appropriate State" referenced in Article VI responsible for "authorization and continuing supervision" of the operations of a private, commercially owned satellite in a scenario where four or more States are involved in launching the satellite and are therefore potentially liable for damages under Article

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[201] Bin Cheng, "Article VI of the 1967 Outer Space Treaty Revisited: 'International Responsibility', 'National Activities', and 'The Appropriate State'" 26 J. of Space Law 7, 14 (1998).

[202] *Ibid.* What is the genesis of Article VI and its unique approach to State responsibility? According to Professor Cheng, "[i]n the negotiations leading to the conclusion of the Space Treaty, the Soviet Union had wanted to restrict space activities to States only, excluding private entities, whilst the United States wanted them to be open to private entities. Article VI represents a compromise between these two positions." *Ibid.*

[203] See *supra*, Chapter One.

VII?[204] The rapid commercialization and globalization of outer space activities is also giving rise to increasingly complex multinational corporate ownership and operation schemes. If a satellite operator incorporates in an "off-shore" tax haven, is the State of incorporation the "appropriate State"? What if the corporation's principal place of business and satellite control facilities are located in one or more other States – is one of these States the "appropriate State"? Article VI provides no relevant guidance.

While Article VI lacks specific guidance with respect to identifying the "appropriate State", Article VIII of the *Outer Space Treaty* introduces the related but distinct concept of the State of registry. Article VIII provides, in pertinent part, that "[a] State party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body." Article VIII provides no guidance with respect to the relationship or connection between the State exercising "jurisdiction and control" and the "appropriate State" referenced in Article VI. The *Registration Convention* elaborates on the concept of registration by establishing procedures and notification requirements to the United Nations, but also fails to elaborate upon the relationship between the concepts of "jurisdiction and control" the "appropriate State".[205]

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[204] In accordance with Article VII of the *Outer Space Treaty*, a State is internationally liable for damage caused by a space object if that State "launches or procures" the launch of the object, or if the object is launched from its "territory or facility." *Outer Space Treaty, supra* note 139. An example of the distinction between "territory" and "facility" is the Russian Bakinour Cosmodrome located in the State of Kazakstan.

[205] *Registration Convention*, *supra* note 194, art. I(c) provides that "[t]he term 'State of registry' means a launching State on whose registry a space object is carried . . . ." Article I(a)(i) and (ii) defines a "launching State" as "[a] State which launches or procures the launching of a space object . . . [or] [a] State from whose territory or facility a space object is launched." A "'space object' includes component parts of a space object as well as its launch vehicle and parts thereof. *Ibid.* art I(b). In accordance with Article II, "[w]hen a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in appropriate registry which it shall maintain." Article IV requires each State of registry [to] furnish to the Secretary General of the United Nations "as soon as practicable" various information regarding the space object, to include, inter alia, the name of the launching State(s), date and

Although the treaties do not make the connection, logically and practically, the State of registry, who exercises "jurisdiction and control" over a given space object, should also be the "appropriate State" responsible the "authorization and continuing supervision" of the activities of a non-governmental entity (e.g., a private, commercial entity) operating that space object. Adopting this interpretative approach would, amongst other things, clarify the rights and responsibilities of various State parties during international armed conflict, thereby facilitating the reconciliation of competing claims of belligerents and neutrals.

For example, let's assume States A and B are engaged in armed conflict. Remote sensing satellites owned by Space Tec Corporation ("Space Tec") are providing imagery to State A in direct support of State A's combat operations against State B. Space Tec is incorporated in State C, with the majority of shares owned by nationals of State D, and maintains its principle place of business in State E. Space Tec's remote sensing satellites providing direct support to State A are registered in State D under the *Registration Convention*. Assuming State B wishes to secure the cessation Space Tec's support to State A, to whom does it direct its diplomatic efforts? Of course, State B may wish to exert pressure against States C, D and E, but ultimately, the process of dispute resolution under international law and the goal of containing the spread of armed conflict are most effectively served by clearly delineating the status and respective rights and responsibilities of the various States involved. Adopting the interpretive approach set forth above would accomplish these goals -- as the State of registry and appropriate State, State D would bear ultimate legal responsibility for Space Tec's continued support to

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territory or location of launch, the basic orbital parameters of the space object, and its general function. The UN publishes registrations at <http://www.unoosa.org/oosa/en/SORegister/index.html>.

State A. State B would therefore be limited to directing certain lawful responsive actions (e.g., counter-measures and potentially, the use of force) against State D, and not against States C and E.

The ICJ has taken a similar approach in defining the rights and responsibilities of States during armed conflict in international waters. In the *Oil Platforms*[206] case, the ICJ addressed a wide range of issues arising from the use of force by the United States against Iran in response to alleged attacks by the latter against US State and commercial vessels in the Persian Gulf. The case is complex both factually and legally, with multiple opinions from the Court, so we will limit our analysis to only the most pertinent issues.

The dispute in the *Oil Platforms* case arose during the later stages of the Iran/Iraq War (1980-1988), when a number of commercial vessels and warship in the Persian Gulf of various nationalities, belligerent and neutral, were attacked by aircraft, helicopters, warships and mines. In response, various States, including the US, conducted naval patrols and escort missions in the Persian Gulf to protect their commercial vessels and facilitate the flow of commerce and oil generally. One of the attacks alleged by the United States to have been committed by Iran was the mining of a US owned, but Kuwati registered ship, the *Texaco Caribbean*, in international waters. The US claimed that Iran's alleged attack on the *Texaco Caribbean*, when combined with other attacks, triggered its right of self-defense against Iran. The Court rejected this argument, concluding that "whatever its ownership, [the *Texaco Caribbean*] was not flying a United

[206] *Oil Platforms* (Iran v. U.S.) [2003] I.C.J. 161.

States flag, so that an attack on the vessel is not in itself to be equated with an attack of that State."[207]

At first glance, the Court's conclusion appears unfair and simplistic given the reality of "flags of convenience" and the prevalence of complex, multinational shipping arrangements. The Court was certainly mindful of the realities of commercial shipping, so why did it essentially ignore them? By announcing a categorical rule focused on registration status, the Court's reasoning appears designed to limit the spread of armed conflict, in part, by providing a transparent and objective mechanism for belligerent and neutral States to assess their respective rights, obligations and claims vis-à-vis one another. Without a categorical rule of this nature, States would be forced to engage in complex and potentially fruitless analyses of opaque multinational corporate ownership and shipping arrangements to determine which State is ultimately responsible for a given activity. These determinations would ultimately be subjective and therefore susceptible to abuse and manipulation. Such an approach would provide a precarious legal basis for the effective reconciliation of neutral and belligerent claims. One can surmise that in the Court's estimation, the need for clear rules involving the use of force is increasingly necessary in a globalized world where even a geographically limited armed conflict can quickly encompass the interests of multiple States.

Even if we adopt the objective/categorical approach suggested above in the outer space domain, however, problems remain. First, the goal of promoting transparency through registration is undermined to some extent by Article II(2) of the *Registration Convention*, which provides, "[w]here there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the

[207] *Ibid.* at 191.

object . . . without prejudice to appropriate agreements concluded or to be concluded among the launching States on jurisdiction and control over the space object . . . ." Significantly, contrary to the standard procedure requiring the State of registry to notify the UN of its status in accordance with Article IV, there appears to be no requirement for the notification of these "appropriate agreements." Therefore, while one State may hold itself out to the international community as the State of registry for a particular satellite, another State (or intergovernmental organization) may exercise jurisdiction and control over that satellite pursuant to a private agreement.

By way of example, let us briefly consider the intergovernmental satellite organization INTERSPUTNIK. In accordance with Article 4(2) of the *INTERSPUTNIK Agreement*[208] as amended by the *Protocol*[209] thereto, "[t]he space segment shall be the property of the Organization or is leased by the Organization." While the Intersputnik Organization may own satellites, it may not register them because the Organization has not "declare[d] its acceptance of the rights and obligations" of the *Registration Convention* in accordance with Article VI of that Agreement. This being the case, only the Organization's member States may register the Organization's satellites. Assuming the member States register the Organization's satellites, who is exercising legal control over them – the States of registry, or the Organization, which claims legal title? If the Organization and its member States have executed Article II(2) type agreements[210] to

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[208] *Agreement on the establishment of the "INTERSPUTNIK" International System and Organization of Space Communications*, art 4(2), 15 November 1971, online: <http://intersputnik.com/f/downloads/Agreement%201971%20eng.pdf> (accessed: 8 July 2008).

[209] *Protocol on the Amendments on the Establishment of the INTERSPUTNIK International System and Organization of Space Communications*, art 4, 4 November 2003, online: <http://intersputnik.com/f/downloads/Protocol%20on%20amendments%20eng.pdf> (accessed: 8 July 2008).

[210] See discussion and analysis, *supra* Chapter Four.

transfer jurisdiction and control of the satellites to the Organization, there is no legal obligation to notify the UN of these agreements. An amendment to the *Registration Convention* requiring notification of Article II(2) and Article II(2) type agreements to the UN would enhance transparency, which in turn would assist belligerents and neutrals in reconciling their respective claims during armed conflict.

A second problem with the *Registration Convention* is that it only permits a launching State to serve as a State of registry.[211] What if a satellite is transferred once in orbit to a non-launching State? May the acquiring State assume state of Registry responsibility (i.e., jurisdiction and control) over the satellite? The *Registration Convention* fails to provide a mechanism enabling a transfer of this nature, suggesting that it may not be permitted under the Treaty. This apparent oversight means a satellite transferred once in orbit "can conceivably be under the theoretical 'jurisdiction and control' of [one] State while being owned and operated by nationals of a different State."[212] According to one author, "[t]his discrepancy significantly increases the difficulty in determining the legal status of a targeted satellite as being an asset of either a belligerent or a neutral State."[213] There is some evidence of State practice allowing the transfer of registration of an on-orbit satellite to a non-launching State[214], but this practice

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[211] *Registration Convention*, *supra* note 194, art. 2.

[212] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 219.

[213] *Ibid.*

[214] In1989 the United Kingdom notified the United Nations of the registration of a direct broadcasting satellite known as the "BSB-1A." See UN Comm. on the Peaceful Uses of Outer Space, *Report of the Secretariat: Review of the Concept of the "Launching State"* UN Doc. A/AC.105/768 (Jan. 21, 2002) at 16. In 1996, the BSB-1A was sold to a Swedish national. Following the sale, Sweden renamed the satellite "Serius 1" and placed it on its internal registry in accordance with Article II of the *Registration Convention*. *Ibid.* In 1999, Sweden notified the United Nations of the registry change pursuant to Article IV. *Ibid.* See also UN Comm. on the Peaceful Uses of Outer Space, Note Verbale dated 1 February 1999 from the

varies[215], leaving the matter unclear – in most cases, transfers of ownership of on-orbit satellites are not reported to the UN.[216] The diverging State practice in this area has recently prompted the UN General Assembly to express concern and recommend that States pass and implement national laws in accordance with their obligations of "continuing supervision" under Article VI of the *Outer Space Treaty*.[217] Another possibility is an amendment to the *Registration Convention* explicitly authorizing the transfer of registration (and hence jurisdiction and control) to a non-launching State with appropriate notification to the UN. In some respects, an amendment of this nature would be similar to Article 83bis of the *Chicago Convention*, which authorizes a State of registry to transfer "all or part of its functions and duties" to another State following the "lease, charter or interchange" of an aircraft from an operator from the State of registry to an operator from another contracting State.[218] Notably, the transfer is not valid until it is registered with the Council of the International Civil Aviation Organization.[219]

Permanent Mission of Sweden to the United Nations (Vienna) addressed to the Secretary General, UN Doc. ST/SG/SER.E/352 (Feb. 19 1999). It is noteworthy that no State party to the *Registration Convention* objected to Sweden's actions, even though Sweden was *not* an original launching State. Tacit acceptance by States parties of a subsequent practice is sufficient to provide definitional content to a treaty. *See Air Services Agreement Case* (U.S. v. Fr.), 54 I.L.R. 303 (Perm. Ct. Arb. 1978).

[215] See Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 216 (2006), citing Bin Cheng, "Space Objects and Their Various Connecting Factors", *in Outlook on Space Law Over the Next 30 Years* 214 (G. Lafferranderie & D. Crowther eds., 1997).

[216] UN Committee on the Peaceful Uses of Outer Space, Legal Subcommittee, *Practice of States and International Organizations in Registering Space Objects*, 41st Sess., UN Doc. A/AC.105/C.2/L.255, at 7.

[217] UN GAOR 59/115, 59th Sess., *Application of the Concept of the "launching State"*, UN Doc. A/RES/59/115 ¶ 3 (25 January 2005).

[218] *Convention on International Civil Aviation*, art. 83bis, 7 December 1944, 15 U.N.T.S. 295.

[219] *Ibid.*

A final concern with the outer space registration regime is that the number of registrations has steadily declined over the past several years, as reflected in the following data[220]:

In 1972, of 129 space objects launched, 129 were registered

In 1990, of 165 space objects launched, 160 were registered

In 2002, of 92 space objects launched, 73 were registered

In 2004, of 72 space objects launched, 53 were registered

This trend is particularly disturbing when one recalls that the number of space-faring States has grown dramatically in the last several years.[221] An increasing number of new actors coupled with decreasing transparency do not bode well for space security in general, nor for the resolution of specific belligerent and neutral claims during armed conflict.

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[220] Ram Jakhu, Lecture at McGill Institute of Air and Space law, Space Law: General Principles (22 October 2007).

[221] See discussion and analysis, *supra* Chapter One.

Chapter Five: The Law of Neutrality and Military Space Operations

In this Chapter, we will examine the law of neutrality as applied to space-based support to belligerents during international armed conflict. We will first introduce the law of neutrality, focusing on some of its more salient characteristics before moving on to discuss the basic principles and purposes underlying the law. We will next briefly examine the extent to which the law of neutrality has been modified by the collective security framework set forth in the *UN Charter*. While some scholars assert that the law of neutrality is inconsistent with the Charter framework, we will see that the law remains resilient and continues to evolve. Following this discussion, we will explore the application of specific rules of neutrality relevant to an analysis of neutral support to belligerents in the form satellite telecommunications, navigation satellite support, and remote sensing. As in past conflicts, we will see that the law of neutrality will likely evolve hand-in-hand with the related law of contraband, blockade and undersea cable cutting that developed in the context of naval warfare. This analysis will also address the scope of belligerent rights in the face of alleged unneutral service, focussing specifically on belligerent rights to interfere with and/or attack neutral space capabilities.

A. Introduction to the Law of Neutrality

Before embarking upon a detailed discussion of the substantive components of the law of neutrality, a few contextual observations are necessary. First, the basic principles underlying the law of neutrality described in this section were codified at a time when a State could lawfully resort to the use of force for whatever purpose or reason it chose.[222]

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[222] *Hague Convention V* and *XIII* were adopted in 1907, before the *Kellogg Briand Peace Pact* (1928) (outlawing war as instrument on national policy) and the *UN Charter* (prohibiting the threat or use of

As we will see in the next section, the traditional rights and duties of neutrals and belligerents as herein discussed are subject to situational modification by UN Security Council action pursuant to its Article 39 collective security authority. Second, and related to the first point, the traditional law of neutrality pre-dating the *Kellogg-Briand Peace Pact* and *UN Charter* did not recognize the practice of non-belligerency, wherein a non-participant State provides assistance to a victim State subject to attack by an aggressor State. The legal validity of non-belligerency status under international law is unclear – to the extent it gains acceptance in State practice, it will also serve to modify the traditional rules discussed herein. We will examine non-belligerency in more detail in the next section. Third, while the customary principles underlying the law of neutrality may be easy enough to state (e.g., duty of impartiality and abstention), they are general and pragmatic in nature and thus subject to dynamic and flexible application. Application of these principles in practice is often heavily influenced by the relative power positions of the belligerent and neutral States in a given international armed conflict. One commentator aptly notes that "laws of neutrality probably had their sources in the practical ability of non-participants in a war to insist on certain rights and on the corresponding practical ability of belligerents to impose some duties."[223] Another commentator states, "[t]he specific conduct indulged in by any particular neutral vis-a-vis any particular belligerent might vary depending upon the power relationship of the opposing belligerent sides and of the neutral."[224]

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force). See *Renunciation of War as an Instrument of National Policy (Kellogg-Briand Peace Pact)*, 27 August 1928, 2 Bevans 732.

[223] H.J. Taubenfeld, "International Actions and Neutrality" (1953) 57 A.J.I.L. 377, cited in Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 216.

In attempting to strike a balance between competing claims of belligerents and neutrals, the reciprocal interplay of various rights and duties making up the law of neutrality implicitly recognizes this power dynamic. For example, as we will see, a neutral State is not obligated to prevent its nationals from exporting munitions and war materiel to a belligerent, but at the same time, the same neutral has a duty to acquiesce to certain belligerent repressive measures, such as the establishment of contraband and blockade operations, designed to prevent the export of goods to an enemy.[225] Oppenheim notes this interplay when tracing the development of the law of blockade – as neutral claims to freedom of the sea and neutral commerce became generally recognized, "the exceptional restrictions of blockade became at the same time recognized as legitimate."[226] As armed conflict enters the domain of outer space, this same dynamic will unfold – as neutral States assert claims of freedom of access to outer space, belligerent States will draw upon the dynamic nature of the law of neutrality to adapt and develop repressive measures (e.g., information blockade) designed to achieve their wartime strategic and tactical goals.

We will now begin our discussion of the substantive components of the law of neutrality. The basic aim of the law of neutrality is to "define[] the legal relationship between nations engaging in hostilities (belligerents) and nations not taking part in such

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[224] Walter L. Williams, Jr., "Neutrality in Modern Armed Conflicts: A Survey of the Developing Law" (1980), 90 Mil. L. Rev. 9, 20.

[225] See discussion *infra*, Chapter Five.

[226] Oppenheim, *International Law: A Treatise*, supra note 149 at 775.

hostilities"[227] By defining the respective rights and obligations of belligerents and neutrals, the law of neutrality ultimately seeks to "localize war, to limit the conduct of war . . . and to lessen the impact of war on the international commerce."[228] In the absence of an international commitment to the contrary, customary international law contemplates that "all nations have the option to refrain from participation in an armed conflict by declaring or otherwise assuming neutral status."[229] In its most succinct form, the law of neutrality has been described as follows:

> The law of armed conflict reciprocally imposes duties and confers rights upon neutral nations and upon belligerents. The principal right of the neutral nation is that of inviolability; its principal duties are those of abstention and impartiality. Conversely, it is the duty of a belligerent to respect the former and its right to insist upon the latter.[230]

We may add to this a neutral State's duties of "prevention" and "acquiescence." We will now briefly review the principles contained in this formulation, as they provide the foundation for more specific rules relevant to our analysis of satellite telecommunications, satellite navigation systems and remote sensing.

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[227] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, U.S. Naval War College International Law Series, Vol. 73, sec. 7.1 (Newport: Naval War College, 1999).

[228] *Ibid.*, citing Myers S. McDougal & Florentino P. Feliciano, *Law and Minimum World Public Order: The Legal Regulation of International Coercion*, 402 (New Haven: Yale University Press, 1961) and Williams, "Neutrality in Modern Armed Conflicts: A Survey of the Developing Law", *supra* note 224. The Annotated Supplement to the Commander's Handbook goes on to state, "the law of neutrality continues to serve an important role in containing the spread of hostilities, in regulating the conduct of belligerents with respect to nations not participating in the conflict, in regulating the conduct of neutrals with respect to belligerents, and in reducing the harmful effects of such hostilities on international commerce." *Ibid.*

[229] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.2. While it is not unusual for non-participating States to issue proclamations of neutrality upon the outbreak of armed conflict, the issuance of a proclamation or special declaration to this effect is not required. *Ibid.*

[230] *Ibid.*, citing Robert W. Tucker, *The Law of War and Neutrality at Sea*, International Law Studies, NAVAPERS 15031, Vol. XLX, 202-18 and note 14 (Newport: U.S. Naval War College, 1955).

The neutral State's right of inviolability is codified in Article I of *Hague Convention V*, which provides that "[t]he territory of neutral Powers is inviolable." In accordance with applicable principles of international law, neutral territory includes all neutral land, internal waters, territorial seas, archipelagic waters and the airspace adjacent to all of the above.[231] The right of inviolability, while not defined in *Hague V*, basically means that a belligerent may not occupy or conduct military operations from or within the territory of a neutral State – this would include a prohibition on the use of land, naval, air and space forces or assets.[232] Some examples of this general rule include the prohibition on belligerents moving troops or convoys of munitions or supplies across the territory of a neutral (*Hague V*, Article 2), the prohibition on belligerents erecting a wireless telegraphy station or other apparatus on the territory of the neutral for the purpose of communicating with belligerent forces on land or sea (*Hague V*, Article 3(a)), and the prohibition on belligerents forming a "[c]orps of combatants" or "recruiting agencies" on neutral territory (*Hague V*, Article 4). Significantly, a neutral maintains a legal duty to defend against encroachment of its right of inviolability -- *Hague V*, Article 5 provides that a neutral State "must not allow any of the acts referred to in Articles 2-4 to occur on its territory."

Related to the principle of "inviolability" is that of "respect for sovereign rights." Referenced briefly, but not specifically elaborated upon in *Hague XIII*, is the belligerent

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[231] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 212; see also, *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.3.

[232] Some examples from *Hague V* include the prohibition on belligerents moving troops or convoys of munitions or supplies across the territory of a neutral (Article 2), and the prohibition on belligerents erecting "on the territory of a neutral Power a wireless telegraphy station or other apparatus for the purpose of communicating with belligerent forces on land or sea." *Hague V*, *supra* note 5 at art. 3(a).

duty "to respect the sovereign rights of neutral powers." The scope of this duty incorporates "both respect for the territorial integrity of the neutral State and [for] the exercise of the sovereign rights of the neutral States within international space."[233] Neutral rights in outer space derive primarily from the bedrock principle that "[o]uter space . . . shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law . . . ."[234] As this principle is similar to that of the "freedom of the high seas"[235], the evolution of the principle of respect for the sovereign rights of neutrals in the context of naval warfare may be instructive in hypothesizing its applicability in the outer space domain. Under the laws of armed conflict, "the term 'respect' is used to create legal protection for a category of individuals or objects, precluding a legitimate attack."[236] While the categorical nature of this principle would suggest a clear duty not to attack a neutral individual or object, in practice, the principle has evolved into a "due regard" standard reflecting an "accommodation of interests or a balancing of rights and duties" between belligerents and neutrals during naval warfare.[237] The "due regard" standard is articulated in paragraph 12 of the *San Remo Manual on International Law Applicable to Armed Conflict at Sea*, which provides that "[i]n carrying out operations in areas where neutral States enjoy

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[233] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", *supra* note 3 at 212.

[234] *Outer Space Treaty*, *supra* note 139, art. 1., para. 2.
[235] *United Nations Convention on the Law of the Sea*, art. 87, 10 Dec. 1982, 1833 U.N.T.S. 3, 397.

[236] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", supra note 3 at 222-23, citing M.S. McDougal & W.T. Burke, *The Public Order of the Oceans*: *A Contemporary International Law of the Sea* 51-52 (New Haven, Yale University Press, 1962) (". . . when considering obligations of behaviour the term "respect" is used in the law of armed conflict to mean that armed force should not be directed against protected persons or objects").

[237] Michel Bourbonniere, "The Ambit of the Law of Neutrality and Space Security" 36 Israel Y.B. on Human Rights 205, 222-23 (2006), quoting J.A. Roach, "The Law of Naval Warfare at the Turn of Two Centuries" 94 A.J.I.L. 64, 68 (2000).

sovereign rights, jurisdiction, or other rights under general international law, belligerents shall have due regard for the legitimate rights and interest of those neutral States."[238] The application of this standard in the context of outer space conflict is consistent with, and reinforces the "due regard" principle set forth in Article IX of the *Outer Space Treaty*, discussed in Chapter Three. The related themes of "accommodation of interests" and "balancing of rights and duties" implicit in the due regard standard are a defining feature of the law of neutrality, and will undoubtedly remain so as this law is applied in outer space.

Balancing the neutral's right of inviolability and respect for their sovereign rights are the neutral's duties of impartiality, abstention, prevention and acquiescence.[239] The duty of impartiality may be defined "as obligating neutral States to fulfill their duties and to exercise their rights in an equal (i.e., impartial or non-discriminatory) manner toward all the belligerents."[240] The reciprocal nature of this duty is evident in that it "corresponds to the belligerent's right to demand impartiality on the part of the

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[238] *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, International Institute of Humanitarian Law, para. 12 (Cambridge: Cambridge University Press, 1995). The San Remo Manual provides "a contemporary restatement of the law, together with some progressive development, which takes into account recent State practice, technological developments and the effect of related areas of the law, in particular, the United Nations Charter, the 1982 Law of the Sea Convention, air law and environmental law." *Ibid* at Foreward, ix (statement of Ambassador Hector Gros Espiell, President, International Institute of Humanitarian Law).

[239] Tucker, *The Law of War and Neutrality at Sea*, supra note 230 at 202-03 and note 14. Tucker states:

> Although the law of neutrality imposes duties and confers rights upon the neutral and belligerent alike the focus of an inquiry into this law may perhaps best be centered around the duties of the neutral. In brief, four general duties are imposed upon neutral States: the duty to act impartially toward the belligerents; the duty to abstain from furnishing belligerents any material assistance for the prosecution of the war; the duty to prevent the commission of hostile acts within neutral jurisdiction as well as to prevent the use of neutral jurisdiction as a base for belligerent operations; and finally, the duty to acquiesce in certain repressive measures taken by belligerents against private neutral commerce on the high seas.

[240] *Ibid.* at 203.

neutral."[241] The duty of impartiality is illustrated in the preamble to *Hague XIII*, which provides "it is, for neutral Powers, an admitted duty to apply these rules impartially to the several belligerents."[242]

Neutral States also maintain a duty to abstain from furnishing belligerents with certain goods or services.[243] The neutral's duty to abstain "is a broad one and covers a vast field of governmental activities . . . [to include] placing its various governmental agencies at the disposal of a belligerent in such a way as to aid it directly or indirectly in the prosecution of the war."[244] The classic example is *Hague XIII*, Article 6, which forbids neutral States from supplying belligerents, directly or indirectly, with "war-ships, ammunition, or war material of any kind."[245] Traditionally, however, this duty is limited

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[241] *Ibid.* at 203, note 15.

[242] Most relevant for our purposes, the duty of impartiality is articulated in *Hague V*, Articles 8 and 9. We will analyze the applicability of these Articles to satellite telecommunications and navigation services later in this Chapter.

> Article 8. A neutral Power is not called upon to forbid or restrict the use on behalf of the belligerents of telegraph or telephone cables or of wireless telegraphy apparatus belonging to it or to Companies or private individuals.
>
> Article 9. Every measure of restriction or prohibition taken by a neutral Power in regard to the matters referred to in Article[] . . . 8 must be impartially applied by it to both belligerents. A neutral Power must see to the same obligation being observed by Companies or private individuals owning telegraph or telephone cables or wireless telegraphy apparatus.

[243] Tucker, *The Law of War and Neutrality at Sea*, *supra* note 230 at 206.

[244] *Ibid.* at 202, note 14, quoting C.C. Hyde, *International Law, Chiefly as Interpreted and Applied by the United States* (Boston, Little Brown, 2nd rev. ed., 1945), at 2230-31.

[245] See also *Hague Rules of Aerial Warfare*, 32 A.J.I.L. (Supp.) 12 (1938), signed on 19 February 1923, at The Hague; not in force, art. 44 ("The supply in any manner, directly or indirectly, by a neutral government to a belligerent Power of aircraft, parts of aircraft, or material, supplies or munitions required for aircraft is forbidden").

only to State action, as "[a] neutral power is not bound to prevent the export or transit, for the use of either belligerent, of arms, ammunition, or, in general, of anything which could be of use to an army or fleet."[246] It is highly questionable whether this dichotomy between State and private action retains any force under contemporary international law. Since World War II, States have closely regulated the international movement of arms and war materiel, often asserting neutrality to prohibit transfer of arms and war materiel by their private citizens.[247] The extensive nature of State regulation in this area is such that one author notes "the developing trend of customary international law is that a neutral State is under a duty to take all reasonable measures to prevent provision of materials and other assistance to a belligerent by individuals and associations under its [regulatory] control."[248] Even if this dichotomy still retains force, however, it is qualified by the belligerent's privilege to impose repressive measures authorized by international law (e.g., contraband and blockade). We will discuss these repressive measures shortly.

Under traditional international law, a similar dichotomy exists with respect to providing information concerning belligerent movements (i.e., the provision of military intelligence). The neutral's duty to abstain clearly extends to the provision of military intelligence to one belligerent concerning, *inter alia*, the military operations of the other

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[246] *Hague XIII*, *supra* note 5, art. 7. See also *Hague V*, *supra* note 5, art. 7 ("A neutral Power is not called upon to prevent the export or transport, on behalf of one or other of the belligerents, of arms, munitions of war, or, in general, of anything which can be of use to any army or a fleet"); *Hague Rules of Aerial Warfare*, *supra* note 245, art. 45 ("Subject to the provisions of Article 46, a neutral Power is not bound to prevent the export or transit on behalf of a belligerent of aircraft, parts of aircraft, or material, supplies or munitions for aircraft").

[247] Williams, "Neutrality in Modern Armed Conflicts: A Survey of the Developing Law", *supra* note 224 at 32-33 (1980), citing Patrick M. Norton, "Between the Ideology and the Reality: The Shadow of the Law of Neutrality" 17 Harv. Int'l L. J. 249, 298 (1976) for survey of State practice.

[248] *Ibid.* at 33.

belligerent.[249] According to Oppenheim, however, "a neutral bears no responsibility whatever for private vessels sailing under the flag which give such information [although] such vessels run the risk . . . of being punished for rendering unneutral service."[250] To the extent this dichotomy retains any legal force in contemporary naval warfare, it will almost certainly not apply to private activities in outer space relating to the provision of remote sensing data to a belligerent in furtherance of ongoing military operations. As we saw in Chapter Four, States are directly responsible for the actions of commercial activities in outer space in accordance with Article VI of the *Outer Space Treaty*. As discussed in Chapter Four, the challenge is identifying which State bears primary responsibility in a given circumstance.

A neutral State also has a duty to prevent the commission of certain acts within its jurisdiction.[251] For example, a neutral must not permit belligerents to move troops or convoys across its territory, nor to erect communications facilities on its territory for purposes of communicating with belligerent forces on land or sea.[252] More generally, a neutral must prevent use of its jurisdiction as a base of belligerent operations.[253] Most relevant for our purposes is Article 47 of the *Hague Rules of Aerial Warfare*[254], which provides that "[a] neutral State is bound to take such steps as the means at its disposal permit to prevent within its jurisdiction aerial observation of the movements, operations

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[249] Oppenheim, *International Law: A Treatise*, supra note 149 at § 356.

[250] Oppenheim, *International Law: A Treatise*, supra note 149 at § 356(1).

[251] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.2, note 12.

[252] See *Hague V*, *supra* note 5 at arts. 2, 3(a) and 5.

[253] Tucker, *The Law of War and Neutrality at Sea*, *supra* note 230 at 203, note 14.

[254] Hague Rules of Aerial Warfare Rules, *supra* note 245, art. 47.

or defense of one belligerent, with the intention of informing the other belligerent." We will analyze Article 47 in the context of satellite remote sensing later in this chapter.

Finally, a neutral "has a duty to acquiesce in the exercise by belligerents of those repressive measures international law permits the latter to take against neutral merchantmen engaged in the carriage of contraband, breach or attempted breach of blockade, or in the performance of unneutral service."[255] We will briefly review the law relating to contraband and blockade before exploring potential applications in outer space later in the chapter.

Simply defined, contraband "consists of goods which are destined for the enemy of a belligerent and which may be susceptible to use in armed conflict."[256] Upon initiation of hostilities, belligerents often publish lists of declared contraband goods for purposes of notifying neutral States. "Contraband goods are liable to capture at any place beyond neutral territory, if their destination is the territory belonging to or occupied by the enemy."[257] Belligerents enforce contraband restrictions against both neutral aircraft

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[255] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.2, note 12 (1999).

[256] *Ibid.* at sec. 7.4. Contraband has traditionally been divided into two categories: absolute and conditional. The distinction has been succinctly defined as follows:

> Absolute contraband consist[s] of goods whose character made it obvious that they were destined for use in armed conflict, such as munitions, weapons, uniforms, and the like. Conditional contraband is goods equally susceptible to either peaceful or warlike purposes, such as foodstuffs, construction materials, and fuel. *Ibid.*

This distinction has largely collapsed since the beginning of World War II because "it became increasingly difficult to draw a meaningful distinction between goods destined for an enemy government and its armed forces and goods destined for consumption by the civilian populace" in age of total societal wartime mobilization. *Ibid.* "As a result, belligerents treated all imports directly or indirectly sustaining the war effort as contraband without making a distinction between absolute and conditional contraband. *Ibid.*

[257] *Ibid.* at sec. 7.4.1.

and sea vessels in two ways: (1) issuing certificates of non-contraband carriage, and (2) visit and search. A certificate of non-contraband carriage is utilized "to facilitate belligerent control of contraband goods with minimal interference and delay of neutral commerce."[258] The certificate is "a document issued by a belligerent . . . official to a neutral vessel (navcert) or neutral aircraft (aircert) certifying that the cargo being carried has been examined, usually at the initial place of departure, and has been found to be free of contraband."[259] The belligerent right of visit and search evolved to provide belligerent warships and aircraft "a means . . . to determine the true character (enemy or neutral) of merchant ships encountered outside neutral territory, the nature (contraband or exempt "free goods") of their cargo, the manner (innocent or hostile) of their employment, and other factors bearing on their relation to the armed conflict."[260] Neutral warships are not subject to visit and search.[261] Likewise, neutral military aircraft are not subject to visit and search.[262] States have developed elaborate procedures for visit and search operations at sea.[263] There appears to be no established international practice with respect to visit and search of a vessel by a military aircraft, although "visit and search of an aircraft by an

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[258] *Ibid.* at sec. 7.4.2.

[259] *Ibid.* See also *San Remo Manual*, *supra* note 238 at paras. 122-24.

[260] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.4.2, citing *Hague XIII*, *supra* note 5, art. 2, Tucker, *The Law of War and Neutrality at Sea*, *supra* note 230 at 332-33, and *San Remo Manual*, supra note 238 at para.118.

[261] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.6.

[262] This must be inferred from the relevant authorities. See *Hague Rules of Aerial Warfare*, supra note 245, art. XLIX ("[p]rivate aircraft are liable to visit and search and to capture by belligerent military aircraft) and art. LI ("[n]eutral public non-military aircraft . . . are subject only to visit for the purpose of the verification of their papers").

[263] See, e.g., *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.6.1 (providing eight (8) step standing operating procedure utilized by the U.S. Navy).

aircraft may be accomplished by directing the aircraft to proceed under escort to the nearest convenient belligerent landing area."[264]

The customary practice of blockade is a "belligerent operation to prevent vessels and/or aircraft of all nations, enemy as well as neutral, from entering or exiting specified ports, airfields, or coastal areas belonging to, occupied by, or under the control of an enemy nation."[265] The rules governing blockade "reflect a balance between the right of a belligerent possessing effective command of the sea . . . and the right of neutral nations to carry out neutral commerce with the least possible interference from belligerent forces."[266] The essential purpose of a blockade is "to deny the enemy use of enemy and neutral vessels or aircraft to transport personnel and goods to or from enemy territory."[267] Unlike the law of contraband, the law of blockade affords neutral warships and military aircraft "no positive right of access to blockaded areas" although the belligerent may establish special entry and exit authorizations.[268] To be valid under traditional rules of international law, a blockade must meet the following criteria:

(1) Establishment. A belligerent State typically establishes a blockade by issuance of a declaration including, at minimum "the date the blockade

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[264] *Ibid.* at sec. 7.6.2.

[265] *Ibid.* at sec. 7.7.1 (1999), citing Tucker, *The Law of War and Neutrality at Sea*, *supra* note 230 at 354-55. A blockade is not limited to contraband:

> While the belligerent right of visit and search is designed to interdict the flow of contraband goods, the belligerent right of blockade is intended to prevent vessels and aircraft, regardless of their cargo, from crossing an established and publicized cordon separating the enemy from international waters and/or air space. *Ibid.*

[266] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.7.5.

[267] *Ibid.* at sec. 7.1.

[268] *Ibid.* at sec. 7.7.3.

is to begin, its geographic limits, and the grace period granted neutral vessels and aircraft to leave the area to be blockaded."[269]

(2) Notification. The belligerent establishing the blockade must notify all affected States of its imposition. "Because knowledge of the existence of the blockade is an essential element of the offenses of breach and attempted breach of blockade, neutral vessels and aircraft are always entitled to notification."[270]

(3) Effectiveness. A blockade must be effective in order to be valid. In order to be effective "it must be maintained by a surface, air, or submarine force or other mechanism that is sufficient to render ingress or egress of the blockaded area dangerous."[271]

(4) Impartiality. "A blockade must be applied impartially to the vessels and aircraft of all nations. Discrimination by the blockading belligerent in favour of or against the vessels and aircraft of particular nations, including those of its own or those of an allied nation, renders the blockade legally invalid."[272]

(5) Limitations. When establishing and enforcing a blockade, a belligerent may not bar access to or departure from neutral ports and coasts. Neutral States retain the right to engage in neutral commerce that does not involve the blockaded area.[273]

Neutral merchant vessels and civil aircraft are subject to capture or attack for violation of properly established contraband and blockade operations. Paragraph 67 of the *San Remo Manual* provides that a neutral merchant vessel may be attacked if it:

(a) [is] believed on reasonable grounds to be carrying contraband or breaching a blockade, and after prior warning [it] intentionally and clearly refuse to stop, or intentionally and clearly resist[s] visit, search or capture;

(b) Engage[s] in belligerent acts on behalf of the enemy's armed forces;

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[269] *Ibid.* at 7.7.2.1.

[270] *Ibid.* at 7.7.2.2.

[271] *Ibid.* at 7.7.2.3.

[272] *Ibid.* at 7.7.2.4, citing, *inter alia*, *San Remo Manual*, supra 238 at para.100.

[273] *Ibid.* 7.7.2.5.

(d) [is] incorporated into or assist[s] the enemy's intelligence system; or

(f) otherwise make[s] an effective contribution to the enemy's military action, e.g., by carrying military materials . . . . Unless circumstances permit, [is is] to be given a warning, so that [it] can re-route, off-load, or take other precautions.[274]

The same rules apply to neutral civil aircraft.[275] With respect to the belligerent right of capture, the *San Remo Manual* provides, "[n]eutral merchant vessels are subject to capture outside neutral waters if they are engaged in any of the activities referred to in paragraph 67 or if it is determined as a result of visit and search or by other means, that they:

(a) are carrying contraband;

(e) are violating regulations established by a belligerent within the immediate area of naval operations; or

(f) are breaching or attempting to breach a blockade[276]

Again, the same rules apply with respect to the capture of neutral civil aircraft.[277]

B. The Applicability of the Law of Neutrality Under the *UN Charter*

As we observed in Chapter Four, the *UN Charter*[278] prohibits States from threatening or using force as a means of conflict resolution.[279] The UN Security Council maintains collective security authority under Article 39 of the Charter, which requires the Council to "determine the existence of any threat to the peace, breach of the peace, or act

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[274] *San Remo Manual*, *supra* note 238 at para.67.

[275] *Ibid.* at para. 70.

[276] *Ibid.* at para.146.

[277] *Ibid.* at para. 153.

[278] *Charter of the United Nations*, 26 June 1945, 59 Stat. 1031, T.S. 933, 3 Bevans 1153. [*UN Charter*]

[279] *UN Charter*, art. 2(4).

of aggression and . . . make recommendations, or decide what measures shall be taken in accordance with Articles 41 and 42, to maintain or restore international peace and security." If the Security Council acts under Articles 39 and 42 and approves military action (i.e., "operations by air, sea, or land") against, for example, an aggressor State who is in violation of Article 2(4)'s prohibition on the use of force, the following Charter articles are of particular relevance to our analysis of the law of neutrality:

> Article 2(5): All Members shall give the United Nations every assistance in any action it takes in accordance with the present Charter, and shall refrain from giving assistance to any State against which the United Nations is taking preventive or enforcement action.
>
> Article 25: The Members of the United Nations agree to accept and carry out the decisions of the Security Council in accordance with the present Charter.
>
> Article 43: All Members . . . undertake to make available to the Security Council, on its call . . . armed forces, assistance, and facilities . . . necessary for the purpose of maintaining international peace and security.
>
> Article 48(1): The action required to carry out the decisions of the Security Council for the maintenance of international peace and security shall be taken by all Members of the United Nations or by some of them, as the Security Council may determine.
>
> Article 49: The Members of the United Nations shall join in affording mutual assistance in carrying out the measures decided upon by the Security Council.

Assuming Security Council enforcement action under Article 42, how do these articles modify application of the traditional law of neutrality? At minimum, Article 2(5) appears to modify the duties of impartiality and abstention by imposing "a duty of passive discrimination, i.e., non-assistance to an unlawful belligerent [as] characterized

by United Nations action."[280] Beyond that, however, the answer to this question will require a case-by-case analysis of the particular Security Council Resolution in question and an appreciation of State and UN practice under the Charter. For example, the Security Council may alternatively recommend (Art. 39) or obligate (Arts. 39, 42, 43) affirmative assistance by Member States in conducting military operations. Experience under the Charter, however, has demonstrated that:

> States generally have been reluctant to commit military forces or other resources to support [UN] action unless their interests are most directly and immediately seen to be adversely affected if action is not taken. The result is that even when the Security Council does act, the usual outcome is a recommendation to States, leaving to each State the discretion to support the [U.N] effort.[281]

Security Council measures adopted in the wake of North Korea's invasion of South Korea in 1950 provide a case in point. UN Security Council Resolutions S/1501 (1950)[282], S/1511 (1950)[283], and S/1588 (1950)[284] determined that North Korea's actions constituted a "breach of the peace" and recommended that Member States "furnish such assistance to [South Korea] as may be necessary to repel the armed attack." The Security Council Resolutions did not constitute an obligatory call to action -- while many States

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[280] Williams, "Neutrality in Modern Armed Conflicts: A Survey of the Developing Law", *supra* note 224 at 26.

[281] *Ibid.*

[282] U.N.S.C. Res. 82, Doc. No. S/1501 (25 June 1950).

[283] U.N.S.C. Res. 83, Doc. No. S/1511 (27 June 1950).

[284] U.N. S.C. Res. 84, Doc. No. S/1588 (7 July 1950).

contributed forces and assistance, many others did not and still many others adopted a position of impartiality under traditional principles of neutrality.[285]

In sum, while the Security Council possesses theoretical authority to compel affirmative support to military operations, in reality, it is often unable to exercise this authority. Where does that leave our analysis of the law of neutrality? We began by positing that the *UN Charter* modifies the duties of impartiality and abstention by imposing "at minimum" a duty of non-assistance to an unlawful belligerent under Article 2(5) – in practice, it may also be accurate to say that the Security Council lacks the power to impose any duties beyond this.

What if the Security Council is either unable or unwilling to intervene in an ongoing international armed conflict? In this scenario, non-participant States can certainly assume or declare neutral status vis-a-vis the belligerents under the traditional principles of neutrality outlined above. Indeed, "State practice in the Charter period indicates that many Member States have elected to [assume] . . . impartial neutral [status during] armed conflicts."[286]

However, what if, in the absence of Security Council intervention, one or more non-participant States determine that a particular belligerent violated Article 2(4) and elect to provide assistance to the victim State in the form of arms, munitions and/or war materiel? Would such actions of partial/discriminatory assistance constitute a violation of the law of neutrality? Is there an intermediary status of lawful non-belligerency

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[285] Williams, "Neutrality in Modern Armed Conflicts: A Survey of the Developing Law", *supra* note 224 at 26, 34 (1980). As one example, Williams notes that during the Korean conflict, the Arab League and Indonesia cited the duty of prevention in denying military transit facilities to United Nations forces. Williams correctly notes that these refusals did not reflect duties, rather "a permissible exercise of the option not to assist military operations conducted on behalf of the [UN]." *Ibid.*, at 34.

[286] *Ibid.*, at 26.

situated between belligerency and neutrality? We will recall that these questions were of no relevance prior to the adoption of the *Kellogg-Briand Treaty* (outlawing war) and the *UN Charter*. Under traditional customary law, States could resort to armed conflict at their discretion in furtherance of their own policies and purposes. Under *Kellogg Briand* and the *UN Charter*, however, a norm of non-aggression has developed. In the absence of centralized enforcement by the Security Council, States may seek to enforce this norm in a decentralized manner by affirmatively assisting a victim State.

Under the traditional law of neutrality, discriminatory assistance of this nature would certainly violate the principles of impartiality and abstention as well as the specific rules implementing those principles (e.g., *Hague XIII*, Article 6, prohibiting neutral States from supplying "war-ships, ammunition, or war material of any kind . . . ."). However, following the adoption of *Kellogg-Briand* and leading up to World War II, various States (most notably the US) adopted a posture of non-belligerency and provided discriminatory assistance to the United Kingdom under the theory that Germany's violation of *Kellogg Briand's* norm of non-aggression warranted such assistance. The US justified the "destroyers for bases" agreement in 1940 and the Lend-Lease Act of 1941 as permissible discrimination arising from Germany's violation of *Kellogg Briand*:

> A system of international law which can impose no penalty on a law breaker and also forbids other States to aid the victim would be self-defeating and should not help even a little to realize mankind's hope for enduring peace.[287]

[287] U.S., *Statement of U.S. Attorney General to the Senate Committee on Foreign Relations in Support of the Lend Lease Act*, S. Rep. No. 45, 77th Cong., 1st Sess. 4 (1941).

What is the legal status of non-belligerency today? Various codification efforts[288] sought to formally recognize the status of non-belligerency, but to date, it has not been adopted in convention form. After an exhaustive review of scholarly writings and State practice, one author notes that "[m]ost recent commentators . . . say there is no intermediate position between belligerency and neutrality – that is, there is no legal foundation . . . for non-belligerency."[289] However, the same author goes on to note the persistence of the practice and concludes, "[d]espite the commentators' position, the record of armed conflicts since World War II has been that if the confrontation is of any length, States may declare and practice strict neutrality, declare neutrality and act as non-belligerents, or do nothing, perhaps ignoring (or being unaware of) the situation."[290] In hypothesizing the future of non-belligerency, it is perhaps most important to bear in mind the power dynamic that pervades the law of neutrality – if a non-participant State maintains the political will and military and economic resources to implement a policy of non-belligerency, it will do so. If it does not, it will not. Likewise, if a belligerent maintains the will and ability to deter or prevent non-belligerent support, it will also do so. As one commentator has noted, the law of neutrality "has never been a doctrine with an immutably fixed content."[291]

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[288] International Law Association, *Briand-Kellogg pact of Paris (August 27, 1928) Articles of interpretation as adopted by the Budapest Conference* (1934) (London: Sweet & Maxwell, Ltd., 1934); *Harvard Draft Convention on the Rights and Duties of States in Case of Aggression*, 33 (Supp.) A.J.I.L. 827 (1939). See also George K. Walker, "Information Warfare and Neutrality" 33 Vand. J. Transnat'l L. 1079, 1114-18 (2000).

[289] See Walker, "Information Warfare and Neutrality", *supra* note 288 at 1119.

[290] *Ibid.* at 1121.

[291] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", supra note 3 at 229, citing Sir E. Lauterpacht, *International Law – Collected Papers of Hersch Lauterpacht, Vol. 5, Disputes, War and Neutrality*, 611 (Cambridge: Cambridge University Press, 2004).

C. The Law of Neutrality and Satellite Telecommunications

Historically, advances in technology have inevitably informed the development, adaptation and evolution of military strategy and tactics. This was certainly true with the advent and spread of the telegraph, telephone, undersea transmission cables and wireless telegraphy in the late 19th and early 20th centuries. Belligerents quickly grasped that these communication technologies would enable commanders to more effectively and efficiently exercise command and control and coordinate operations over vast distances. Transmission of military intelligence and early warning of attack also became more feasible. These technologies, of course, also emerged as significant drivers of increasing international trade during the same period. Recognizing the inherent civil and military "dual use" nature of these technologies and their unique role in enabling international commerce, the drafters of *Hague V* sought to regulate their use during war time consistent with the Convention's overall purpose of limiting the impact of war on neutral commerce. The following articles from Hague V are most relevant to our analysis:

> Article 8. A neutral Power is not called upon to forbid or restrict the use on behalf of the belligerents of telegraph or telephone cables or of wireless telegraphy apparatus belonging to it or to Companies or private individuals.
>
> Article 9. Every measure of restriction or prohibition taken by a neutral Power in regard to the matters referred to in Article[] . . . 8 must be impartially applied by it to both belligerents. A neutral Power must see to the same obligation being observed by Companies or private individuals owning telegraph or telephone cables or wireless telegraphy apparatus.

Before beginning an analysis of Articles 8 and 9 in the context of satellite telecommunications, we must first address the obvious point that *Hague V* was adopted in

1907, fifty years before humankind first placed an artificial satellite into earth orbit. This historical fact begs the question of whether Articles 8 and 9 apply to satellite telecommunications at all. Although the plain language of the treaty would suggest they are not applicable, we must recall what the ICJ said about the law of neutrality in the *Nuclear Weapons Case*:

> The Court finds that as in the case of the principles of humanitarian law applicable in armed conflict, international law leaves no doubt that the principles of neutrality, whatever its content, which is of a fundamental character similar to that of the humanitarian principles and rules is applicable (subject to relevant provisions of the United Nations Charter), to all international armed conflict whatever type of weapons might be used.[292]

Given the role of satellite telecommunications as a key driver of global trade, and bearing in mind the law of neutrality's underlying purposes of mitigating the spread of armed conflict and protecting neutral commerce, it is almost inconceivable that the law of neutrality would not apply to satellite telecommunications. If this is the case, Articles 8 and 9 will inevitably serve as the starting point for an appropriate analysis.

By their plain language, Articles 8 and 9 appear to impose a duty of impartiality on neutral States rather than a duty of abstention. In other words, neutrals may provide communication services to belligerents (i.e., they need not abstain), but if they choose to impose restrictions or prohibitions, they must do so even-handedly. We will first briefly explore neutral State practice under Articles 8 and 9 during World Wars I and II to determine whether the duty of impartiality has been eclipsed by a duty of abstention. Concluding that the duty of impartiality is still viable, we will then address its application to satellite telecommunications. In particular, we will provide an overview and

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[292] *Nuclear Weapons Case*, *supra* note 170 at para. 89.

assessment of the potential legal bases belligerents may advance in support of operations designed to prevent enemy access to neutral satellite telecommunications services, even if provided impartially.

Addressing the origins of *Hague V*, Article 8 and 9, one noted scholar has stated, "[i]t was clearly understood by the States participating at the [Hague] Conference that the liberty of a neutral State to transmit dispatches, by means of telegraph, wireless or submarine cables, did not imply the right of making use of them, or of permitting them to be made use of, in order to render assistance to one of the belligerents."[293] The purpose of this implied duty appears to have been primarily directed at preventing the transmission of militarily useful information by persons from within neutral territory to one of the belligerents.[294] From the beginning, therefore, neutrals were, implicitly at least, expected to exercise some degree of regulatory control over their communications systems during wartime. To the extent this duty existed, however, it did not presumably impact the applicability of Article 8, which provides that, "[a] neutral Power is not called upon to forbid or restrict the use on behalf of the belligerents of telegraph or telephone cables or of wireless telegraphy belonging to it or to Companies or private individuals." In sum, therefore, neutrals were permitted to open their communications systems to belligerents, but at the same time maintained a duty to prevent the transmission of militarily useful information from within its territory to the belligerents.[295] How did neutral States manage the implementation of these duties? Many neutral States during

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[293] C. John Colombos, *The International Law of the Sea* § 577 (London: Logmans Green & Co., 6th ed., 1967).
[294] *Ibid.* at § 716.

[295] *Ibid.* at § 577 (arguing that *Hague V*, Article 8 provides "wide discretion . . . to neutral States, although their duty of impartiality ought to compel them to prevent the transmission from their territory of messages conveying military intelligence").

World Wars I and II enacted regulations prohibiting the transmission of all coded or ciphered messages, to include those from belligerents.[296] The policy of the US at the outbreak of World War I, for example, "was to assume control of all private wireless stations erected within the United States and to prohibit the sending of all code or cipher messages."[297] Transmissions were monitored by governmental and military personnel.[298]

The evolution of State practice noted above has led one author to conclude that, "[d]uring the two World Wars the trend of decision in practice was to regard neutral States as under a duty to exercise reasonable efforts to regulate all communications systems in their territory to prevent belligerent communication of military information."[299] Another author asserts that "[n]eutral States took these steps to avoid the perception of partiality" not because they maintained a legal duty to do so.[300] How will this history and State practice impact neutral duties with respect to satellite telecommunications? Has a duty of abstention evolved to eclipse the duty of impartiality set forth in Hague V, Article 8?

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[296] See David L. Willson, "An Army View of Neutrality in Outer Space" (2000) 50 A.F. L. Rev. 175, 196 (2000) ("During World War I, many neutral States, including the U.S. before its entry into the war, took various steps to prevent telegraphs and wireless installations within their territories from either being used by belligerents or used by private persons to pass coded messages to one of the belligerents"); Colombos, *The International Law of the Sea*, *supra* note 293 at § 716 (noting that during World War II, "the majority of neutral States passed regulations prohibiting the transmission of telegrams in secret code . . . .").

[297] Colombos, *The International Law of the Sea*, *supra* note 293 at § 579.

[298] *Ibid.* at § 716.

[299] Williams, "Neutrality in Modern Armed Conflicts: A Survey of the Developing Law", supra note 224 at 38, citing McDougal and Feliciano, *Law and Minimum Public World Order: The Legal Regulation of International Coercion*, *supra* note 228 at 460. \

[300] Willson, "An Army View of Neutrality in Outer Space", *supra* note 296 at 197.

First, the fact that neutral States opted to prohibit certain types of belligerent communications (i.e., coded and ciphered) was perfectly consistent with their rights under Article 8. These actions represented a choice under Article 8 to impose restrictions, not a repudiation of the option to authorize belligerent access to communications systems. Moreover, neutral policies during World Wars I and II were a product of the specific historical circumstances and power relationships prevalent at the time and are not necessarily dispositive or even predictive of how neutral States will act now or in the future. State practice may vary considerably in the future and it is unlikely that neutrals will feel legally beholden to precedents from a prior era when the only codified law on point (i.e., Article 8) provides them with greater discretion.

Second, given the massive volume of data in diverse formats (e.g., voice and Internet) transmitted via satellite telecommunications, a neutral wishing to replicate US practice during World Wars I and II would be required to deploy a sophisticated array of monitoring and filtering technologies, not to mention a considerable number of analysts to interpret the data. The technical, monetary and regulatory challenges inherent in an endeavour of this magnitude would be heavily burdensome, if not insurmountable for most States. More significantly perhaps, regulation of this nature is antithetical to contemporary notions of personal privacy rights enshrined in the Constitutions, laws and jurisprudence of many States. As evidenced by the bitter political and legal battles waged in the US over warrantless wiretapping by the National Security Agency, monitoring activities of this nature by a neutral State would face significant, if not decisive opposition. For the foregoing reasons, in the author's opinion, a duty of abstention is not

mandated, and the duty of impartiality remains a viable concept under the law of neutrality as applied to satellite telecommunications.

Assuming a duty of abstention is not required, if a neutral satellite telecommunications provider elects under Article 8 to make signals available to one belligerent, the competing belligerent has a valid claim to demand comparable service, citing the neutral's duty of impartiality under Article 9. If the neutral is unwilling to provide comparable service, it would be in breach of its duty of impartiality. Would the neutral's satellites be subject to attack in this scenario? Most likely so – analogizing this situation to the *San Remo* customary rules developed in the context of naval warfare discussed above, a belligerent will claim the neutral's satellites are subject to attack because they are either "incorporated into or assist[ing] the enemy's intelligence system" or "mak[ing] an effective contribution to the enemy's military action."[301] The customary principles of the international law of armed conflict discussed in Chapter Three (e.g., necessity and proportionality) would apply in regulating the nature and scope of the attack. Alternatively, the offending satellites would also be subject to negation measures discussed in Chapter III that may not rise to the level of an attack (e.g., interference measures such as jamming). These measures could potentially be justified on multiple grounds: (1) as a subsidiary option encompassed within the right of attack discussed above, (2) as encompassed within the freedom of military action principle set forth in Article 48(1) and (2) of the ITU Constitution discussed in Chapter IV, or (3) as

[301] *San Remo Manual*, *supra* note 238 at para.67(d) and (f). Paragraph 67(f) also provides, "[u]nless circumstances permit, [neutral vessels] are to be given a warning, so that they can re-route, off-load, or take other precautions."

permissible counter-measures[302] taken in response to the neutral's violation of its duty of impartiality.

What if the neutral satellite telecommunications provider agrees to provide roughly comparable service to both belligerents -- what options, if any, do belligerents have to deny enemy use of neutral signals? In this scenario, the plain language of Article 8 suggests that a belligerent may not insist or seek to forcibly compel a neutral provider to cease providing signals to an enemy. Is this the end of the analysis? Must a belligerent simply acquiesce to the continued enemy use of the neutral's satellite communications links for the duration of the armed conflict? This appears to be the conclusion reached by the United States Department of Defense Office of General Council (*DODGC*).[303] In a 1999 legal opinion assessing the international legal aspects of information operations, the *DODGC* suggests (although its analysis is not specific) that a neutral satellite telecommunications provider in compliance with Articles 8 and 9 would not be subject to "a limited right of self-defense [by one belligerent] to prevent such use

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[302] Countermeasures can be defined as "measures which would otherwise be contrary to the international obligations of the injured State vis-à-vis the responsible State if they were not taken by the former in response to an internationally wrongful act by the latter in order to procure cessation and reparation." Crawford, *The International Law Commission's Articles on State Responsibility: Introduction, Text and Comments*, *supra* note 199 at 281. In other words, countermeasures are otherwise unlawful acts undertaken by the injured State to compel the breaching State to comply with its international obligations. As applied to our scenario, belligerent interference measures that would otherwise arguably violate Article 45 of the *ITU Constitution* (prohibiting interference) would be lawful if taken in response to a neutral's breach of its duty of impartiality. Countermeasures must be proportionate, i.e., "commensurate to the injury suffered." *Ibid.*, at 294 (Article 51 of ILC Articles on State Responsibility).

[303] See *An Assessment of International Legal Issues in Information Operations, supra* note 147.

by its enemy."[304] The opinion also suggests that belligerent options such as jamming signals in the combat area would likewise not be available.[305]

Given the indispensible nature of satellite communications as an enabler of emerging concepts of network centric warfare discussed in Chapter Two, one must question whether belligerents in future conflicts will accept this conclusion and idly standby while enemy forces freely exploit neutral telecommunications satellite signals. A more likely scenario is that belligerents will act to deny this advantage to their enemies. They will not simply just act, however. They will also seek to justify their actions by promoting functional and reconceptualized interpretations of the law of neutrality based on a reappraisal of old precedents to meet new realities.

For example, the *DODGC*'s opinion cited above fails to discuss or make reference to the neutral's "duty to acquiesce in the exercise by belligerents of those repressive measures international law permits" such as contraband and blockade operations.[306] Historically, of course, the duty of acquiescence and the corresponding practices of contraband and blockade applied in the context of naval warfare. In our discussion of the *San Remo* customary rules above, however, we saw that the law adapted over time to encompass neutral civil aviation. To the extent that neutral rights of freedom of the seas and freedom of aerial navigation and overflight have historically been counter-balanced by belligerent rights, is it not logical to anticipate that belligerents will seek to counter-

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[304] *Ibid.*, at 473.

[305] Although these options would be available, according the DODGC opinion, with respect to enemy use of neutral satellite navigation and remote sensing sytems. *Ibid.*, at 474. We will discuss these systems later in this Chapter.

[306] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.2, note 12.

balance the neutral right of freedom of use of outer space? Tracing the historical evolution of blockade law, one author notes the direct link between the expansion of blockade practices in the 19th and 20th centuries and increasing global economic interdependence.[307] Blockade operations "expanded continuously as the importance of external trade to the enemy's war effort grew."[308] The growth in blockade operations reflected an emerging need "to balance [the] interests of the neutral in unimpeded trade and the interest of the belligerent in not having a neutral compensate for the enemy's weakness."[309] We are, of course, in the midst of another era of globalization, although this era is defined as much by the instantaneous transmission of information services as by the flow of goods and raw materials. Just as belligerents grew increasingly dependent upon the import of goods and raw materials to fuel their economies and war efforts in the past, they are growing increasingly dependent upon access to global information systems (to include foreign satellites) to fuel their economies and war efforts today. To the extent this trend continues, belligerents will naturally and inevitably move to block enemy access to global information systems, to include neutral satellites, during periods of armed conflict. The law of contraband and blockade, therefore, appears ripe for transformation in an emerging era of network-centric, information-based warfare.

The relationship between the text and structure of *Hague V* and *XIII* and the evolution of blockade operations provides legal precedent for the extension of these

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[307] Michael N. Schmitt, "Aerial Blockades in Historical, Legal and Practical Perspective" 2 USAFA J. Leg. Stud. 21, 33 (1991).

[308] *Ibid.*

[309] *Ibid.* at 65, note 39, citing Tucker, *The Law of War and Neutrality at Sea*, *supra* note 230 at 182.

operations into outer space. *Hague XIII*, Article 7 provides that "[a] neutral Power is not bound to prevent the export or transit, for the use of either belligerent, of arms, ammunition, or, in general, of anything which would be of use to an army or fleet." While the neutral State is "not bound to prevent" these activities, belligerents maintain the right to block export of these materials through establishment of contraband and blockade operations outside of neutral territory. Not only this, but neutral States maintain a duty to acquiesce to these operations outside their territory. *Hague V*, Article 8's language is very similar to *Hague XIII*, Article 7 – "[a] neutral Power is not called upon to forbid or restrict use on behalf of the belligerents of telegraph or telephone cable or of wireless telegraphy apparatus belonging to it or to Companies or private individuals." While the neutral State is "not called upon to forbid or restrict" belligerent use, might a belligerent likewise seek to block enemy use of communications signals outside neutral territory? As we saw in our discussion earlier in this chapter, neutral territory is inviolable, but respect for neutral rights in the global commons (i.e., high seas, and by extension, outer space), is subject to a "due regard" standard premised on an "accommodation of interests or a balancing of rights and duties" between belligerents and neutrals.[310] Belligerents will rely on this convergence of text and State practice to extend contraband and blockade operations into outer space, and, as we will see shortly, have already advanced similar positions with respect to the law governing undersea cable cutting.

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[310] Bourbonniere, "The Ambit of the Law of Neutrality and Space Security", supra note 3 at 222-23, quoting J.A. Roach, "The Law of Naval Warfare at the Turn of Two Centuries" (2000) 94 A.J.I.L. 64, 68. We will recall that the "due regard" standard is articulated in paragraph 12 of the *San Remo Manual*, which provides that "[i]n carrying out operations in areas where neutral States enjoy sovereign rights, jurisdiction, or other rights under general international law, belligerents shall have due regard for the legitimate rights and interest of those neutral States."

How might the practices of contraband and blockade be adapted to satellite telecommunications transmissions? Traditionally, of course, contraband and blockade operations have focussed on preventing the enemy import of tangible goods and materials. At this point, at least, there are no tangible goods or materials transported through space, although this is only a matter of time as sub-orbital commercial space ventures begin to emerge. In the short-term, therefore, space contraband and blockade operations will not focus on blocking the import of tangible items, but rather, on blocking the transmission of data and information to the enemy. Belligerent States with the technological and analytical capacity may seek to establish "contraband lists" of strategically and tactically relevant information prohibited from transmission over neutral telecommunications satellites to enemy territory and/or enemy forces.[311] To enforce these lists, a belligerent may conduct electronic "visit and search" monitoring operations and block offending transmissions (e.g., through temporary and reversible negation measures such as jamming) just as it might prevent or block the carriage of contraband on the high seas (e.g., through capture). Alternatively, a belligerent and neutral may

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[311] The matter of enemy destination raises the potential applicability of the related customary doctrines of "continuous voyage", "continuous transports" and "ultimate destination" which are all premised on the view that "[c]ontraband goods are liable to capture at any place beyond neutral territory, if their destination is the territory belonging to or occupied by the enemy. It is immaterial whether the carriage of contraband is direct, involves transshipment, or requires overland travel." *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations, supra* note 227 at sec. 7.4.1.1. Under these doctrines, contraband is subject to capture when transported from a neutral port to an intermediary port of another non-participant or neutral State. In light of the fact that satellite telecommunications are inextricably intertwined with other modes of transmission (e.g., fiber-optic cables and terrestrial wireless), transmissions going through a neutral State's satellite ultimately destined for belligerent territory may transit through telecommunications networks physically located in other non-participant neutral countries before arriving in belligerent territory. The technical aspects of these issues are complex and beyond the scope of this thesis, but for our purposes, it's important to note that belligerents seeking to initiate information contraband and blockade operations must be prepared to articulate a legal rationale for blocking transmissions through a neutral telecommunications satellite initially destined for another neutral State as commerce between neutrals is protected during armed conflict. *Ibid.*, at 7.4. The customary doctrines of "continuous voyage", "continuous transports" and "ultimate destination" may provide that justification.

establish an "electronic certification" process wherein the neutral allows the belligerent access to its satellite control operations to certify "non-contraband carriage" of individual transmissions into enemy territory.

As we saw earlier in this chapter, the customary practice of blockade is a "belligerent operation to prevent vessels and/or aircraft of all nations, enemy as well as neutral, from entering or exiting specified ports, airfields, or coastal areas belonging to, occupied by, or under the control of an enemy nation."[312] A belligerent seeking to impose an information blockade may attempt to block (e.g., through temporary and reversible negation measures such as jamming) all satellite telecommunications transmissions to specified areas within the enemy's sovereign territory, or territory under the occupation or control of the enemy (e.g., military facilities, command control nodes, government offices, troop concentrations, etc...). Fusing the capabilities of signals monitoring, aerial and satellite remote sensing and negation measures such as jamming, a belligerent with information superiority may be able to narrowly tailor and precisely execute information blockade operations to produce desired effects while minimizing collateral damage. Indeed, under the law of armed conflict, a belligerent contemplating these operations is under a duty to carefully analyze second and third order effects on the civilian population to determine whether such effects "would be excessive in relation to the concrete and direct military advantage anticipated."[313] A belligerent contemplating these operations

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[312] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.7.1, citing Tucker, *The Law of War and Neutrality at Sea*, *supra* note 230 at 354-55.

[313] *Protocol I to the Geneva Conventions*, *supra* note 174, arts. 51.5(b), 57.2(a)(iii), and 57.2(b); see also, *San Remo Manual*, *supra* note 238 at para. 102(b) ("[t]he declaration or establishment of blockade is prohibited if . . . the damage to the civilian population is, or may be expected to be, excessive in relation to the concrete and direct military advantage anticipated from the blockade."

could comply with the traditional principles governing blockade by issuing a formal declaration establishing "the date the blockade is to begin [and] its geographic limits" and notifying all affected states.[314] Notices and amendments thereto could be made, for example, to the ITU and placed on the Organization's website.

State practice with respect to belligerent undersea cable cutting also lends some precedential support to belligerent information blockade operations. The 1884 *International Convention for the Protection of Submarine Telegraph Cables* formulated rules concerning the protection of undersea cables, but only during peacetime.[315] Article 15 of the Convention explicitly provides that belligerents retain "freedom of action" during armed conflict. As one author notes, "[i]t is understood that the stipulations of the . . . Convention do not in any way restrict the freedom of belligerents."[316] Conventions regulating the law of armed conflict provide only brief and limited reference to belligerent cable cutting operations. Article 54 of the Regulations on land warfare (attached to *Hague IV*) provides "[s]ubmarine cables connecting an occupied territory with a neutral territory shall not be seized or destroyed except in case of absolute necessity; they must also be restored and the indemnities for them regulated at the

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[314] *Annotated Supplement to the Commander's Handbook on the Law of Naval Operations*, *supra* note 227 at sec. 7.7.2.1 (1999).

[315] *International Convention for the Protection of Submarine Telegraph Cables*, signed at Paris, 14 March 1884, online: <http://www.iscpc.org/information/Convention_on_Protection_of_Cables_1884.pdf> (accessed: 8 July 2008). The major issues generating the need for the Convention appears to have been the need to protect cables from trawler ships, which were continually breaking the lines laid in the shallow waters of the North Sea and English Channel. See P.M. Kennedy, "Imperial Cable Communications and Strategy, 1870-1914" The English Historical Review (1971) Vol. 86, No. 341, at 732.

[316] Kennedy, "Imperial Cable Communications and Strategy, 1870-1914", *supra* note 315 at 732. The British delegate, Lord Lyons, noted "Her majesty's Government understands article 15 in this sense, that, in time of war, a belligerent, a signatory of the Convention, shall be free to act in regard to submarine cables as if the Convention did not exist." Colombos, *The International Law of the Sea*, *supra* note 293 at § 569.

peace."[317] This is limited, however, to "land warfare where one belligerent occupies the territory of his adversary and seizes or destroys the landing ends of the cables connecting the territory with a neutral State."[318] In other words, Article 54 would not apply in non-occupation scenarios.

Given this permissive legal environment, State practice developed in the late 19th and early 20th centuries supporting the proposition that belligerents were permitted to cut cables linking neutral and enemy territories, irrespective of cable ownership, "if the necessities of war require" and the cutting occurs "outside of neutral territory."[319] Support for this proposition, however, was by no means unanimous. The Institute of International Law discussed the topic twice, but these discussions "revealed considerable differences of opinion . . . as the interests of neutrals and the rights of belligerents are in conflict on this matter."[320] A dispute between the US and United Kingdom arising from American cable cutting operations during the Spanish-American War is of particular relevance in discerning the legal parameters of early State practice. US naval forces cut "cables uniting Cuba, Manila and Porto Rico (sic) with the outer world, even though they were neutral (British property)."[321] When the US refused British claims for compensation, the parties submitted the dispute to the British-American Claims Arbitration Tribunal in 1923. The British claims were denied on the grounds that:

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[318] Colombos, *The International Law of the Sea*, supra note 293 at § 569.

[319] *Ibid.* at § 570.

[320] *Ibid.*

[321] *Ibid.* at § 574. Acoording to Colombos, "[t]he cutting of the Manila-Hong Kong cable put out of action an instrument of particular value to the general commercial interests of the Far East." *Ibid.*, citing E.J. Benton, *International law and diplomacy of the Spanish-American War* 212 (Baltimore: John Hopkins Press, 1908).

> [N]ot only does the cutting of cables appear not to be prohibited by the rules of international law applicable to sea warfare, but such action may be said to be implicitly justified by that right of legitimate self-defence which forms the basis of the rights of any belligerent nation.[322]

Belligerent cable-cutting operations continued through World Wars I and II, but by 1967, one noted scholar remarked that there was no "clearly ascertainable" law governing the treatment of cables in time of war.[323] By mid-century, US practice and doctrine supported belligerent rights:

> Submarine telegraph cables between points in an enemy's territory, between points in the territories of enemies, between points in the territory of an enemy and neutral territory or between points in occupied territory and neutral territory are subject to such treatment as the necessities of war may require. Submarine cables between two neutral territories should be held inviolable and free from interference.[324]

One significant factor distinguishing belligerent satellite transmission blocking operations and cable cutting operations is that the former can be done on a temporary and reversible basis (e.g., jamming) causing no physical damage. Contrariwise, cable cutting is a blunt instrument, causing permanent physical damage. In balancing the interests of belligerents and neutrals, this factor weighs in favor of the belligerent contemplating information blockade operations, and increases the prospect that neutral satellite operators would be willing to acquiesce to such operations. Of course, as we have discussed previously, the

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[322] *British-American Claims Arbitration Tribunal* (Award, 9 November 1923), reprinted in 18 A.J.I.L. 835, 842 (1924), quoted in Colombos, *The International Law of the Sea*, *supra* note 293 at § 574.

[323] Colombos, *The International Law of the Sea* , *supra* note 293 at. § 575.

[324] *Law of Naval Warfare* § 520 (U.S. Navy, 1955), reprinted in Tucker, *The Law of War and Neutrality at Sea,* supra note 230 at 359, and quoted in Colombos, *The International Law of the Sea*, *supra* note 293 at § 576. State practice may evolve to justify blocking communications between two neutrals under the "continuous voyage" doctrine for the reasons set forth in *supra* note 311.

nature of the conflict, the interests at stake and the power dynamic governing relations between the belligerents and neutrals will inevitably factor into this analysis as well.

A more limited, but perhaps less controversial belligerent right to block neutral satellite transmissions to an enemy derives from the belligerent's customary right to "order neutral vessels or neutral aircraft on or over the high seas . . . not to make use of their radio transmitting apparatus while in the immediate vicinity" of ongoing belligerent operations.[325] As applied to satellite operations, a belligerent may order a neutral not to transmit telecommunications signals to specified geographic coordinates coinciding with the "immediate vicinity" of ongoing military operations. Of course, belligerents may seek to define "immediately vicinity" broadly, but the basic right appears firmly established in customary law.

D. The Law of Neutrality and Global Navigation Satellite Systems

As one can imagine, States do not openly discuss many details regarding their counter-space negation strategies, doctrines, capabilities and intentions. A rare glimpse into this world, however, was revealed in 2004 during negotiations between the European Union (EU) and US regarding proposed measures to ensure the future compatibility and interoperability of the Galileo and GPS satellite navigations systems. During the course of these negotiations, "[t]he European delegates reportedly said they would not turn off or

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[325] *Hague Rules for the Control of Radio in Time of War*, 17 A.J.I.L. (Supp.) 242 (1923), signed on 19 February 1923; not in force. See *Ibid.* at art. 7. Although the Hague Radio Rules were never ratified, the rules set forth in Article 7 "became general practice and customary law" during World War II. *The Law of Naval Warfare: A Collection of Agreements and Documents with Commentaries*, 376 (Dordrecht: Nijhoff, N. Ronzitti, ed., 1988). See also, *San Remo Manual, supra* note 238 at para. 108 ("[n]othing in this section should be deemed to derogate from the customary belligerent right to control neutral vessels and aircraft in the immediate vicinity of naval operations").

jam signals from their [Galileo] satellites, even if they were used in a war with the United States." According to a senior European delegate, the US responded by "ma[king] it clear that they would attempt what they called reversible action, but, if necessary, they would use irreversible actions [against Galileo transmissions]." While not presented as such, implicit in this discussion appear to be competing views of the law of neutrality as applied to satellite navigation systems -- the EU advocating a duty of impartiality and the US a duty of abstention.

The EU and US ultimately signed a legally binding agreement intended to serve as a "framework for cooperation between the parties in the promotion, provision and use of civil GPS and GALILEO . . . ."[326] Article 11(2) of this Agreement provides that "[t]he parties intend to prevent hostile use of satellite-based navigation and timing services while simultaneously preserving services outside areas of hostilities."[327] Although the scope and intent of Article 11(2) are to some extent unclear,[328] the plain language suggests the US prevailed during negotiations, with the EU agreeing to either turn off or jam Galileo signals available to belligerents engaged in armed conflict with the US, or at minimum, acquiesce to US efforts to prevent enemy access to Galileo signals. Of course, the reverse is also true – the US incurs the same obligation vis-à-vis the EU. To the extent the Parties have assumed a duty of abstention with respect to their satellite

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[326] *Agreement on the Promotion, Provision and use of Galileo and GPS Satellite-Based Navigation Systems and Related Applications*, signed 26 June 2004, online: <http://pnt.gov/public/docs/2004-US-EC-agreement.pdf> (accessed: 8 July 2008). [*EU/US Agreement*]

[327] *Ibid.* Additionally, the Parties agreed to establish a "working group" on security, presumably designed, in part at least, to serve as a mechanism to resolve issues arising during armed conflict. *Ibid.* at art. 13(2)(d).

[328] For example, use of the word "intend" rather than the more traditional, and clearly obligatory "shall" suggests that the Parties may have sought to retain some discretion on this matter. A statement of intention alone may not rise to the level of a legal obligation. Moreover, a State can "intend" to do many things, but in questions of war and peace, actions do not always match previously announced intentions.

navigation systems in accordance with Article 11(2), they have done so strictly in a bilateral context. In other words, the Parties maintain this duty vis-à-vis one another, but not in their relations with other States.

This EU and US Agreement constitutes some evidence of emerging State practice, but it is by no means declaratory of a customary rule of international law. State practice consistent with the EU's negotiating posture (i.e.., States assuming a clear duty of impartiality rather than abstention) is certainly foreseeable, and is arguably preferable. As we saw in Chapter I, navigation satellites are essentially a global public utility with applications inextricably intertwined with a vast range of transnational economic activities, enabling, for example, global supply chain management and precision timing for banking and financial transactions. Given the economic consequences of wide-spread signal disruption, and consistent with the underlying purpose of the law of neutrality, neutral States maintaining GNSS capabilities should be afforded discretion to decide whether, and under what circumstances, to block or jam their signals during armed conflict. A duty of impartiality consistent with *Hague V*, Articles 8 and 9, is consistent with the exercise of discretion. A duty of impartiality allows a State to tailor its actions to the particular circumstances in a given case, thus potentially minimizing the impact of any restrictive measures on international trade and commerce. A duty of abstention, on the other hand, immediately and adversely impacts global commerce because neutral signals would be denied to both parties upon the initiation of hostilities. Policy reasons aside, considerations of power politics also factor into this analysis – given the fact that only militarily and economically powerful States currently posses and operate satellite navigations systems (i.e., US, Russia and EU member States), it is unlikely that

belligerents in a given armed conflict would be able to compel these States (in a neutral capacity) to comply with a duty of abstention if they did not voluntarily elect to assume this duty.

Even if, however, a duty of impartiality prevails with respect to GNSS, we must recall that belligerents will undoubtedly assert their right to impose repressive measures such as contraband and blockade operations, and blocking neutral signals in the "immediate vicinity" of hostilities. The same analysis provided earlier in this Chapter with respect to telecommunications satellites would be applicable to global navigation systems as well.

E. The Law of Neutrality and Satellite Remote Sensing

While a neutral State appears to maintain a duty of impartiality with respect to its satellite telecommunications and navigation systems, this is likely not the case with respect to satellite remote sensing systems. A customary rule of of prevention appears most applicable to satellite remote sensing. As briefly referenced earlier in this Chapter, Article 47 of the *Hague Rules of Aerial Warfare* provides:

> A neutral State is bound to take such steps as the means at its disposal permit to prevent within its jurisdiction aerial observation of the movements, operations or defenses of one belligerent, with the intention of informing the other belligerent.

Satellite remote sensing is simply the extension of "aerial observation" into outer space. As there appears to be no functional distinction between outer space and aerial observation from a military intelligence perspective, satellite remote sensing almost certainly falls within the ambit of Article 47's duty of prevention. One could potentially

argue that Article 47 does not apply to satellite remote sensing because it applies only to activities within the neutral's "jurisdiction" and satellite remote sensing occurs in outer space (i.e., in the global commons), not within the neutral's territorial jurisdiction. This argument is unpersuasive because it confuses the concepts of "territory" and "jurisdiction." As we will recall from Chapter Four, the operations of a satellite fall within the "jurisdiction and control" of the State of registry. As such, remote sensing activities in outer space occur within the jurisdictional ambit of the State of registry consistent with Article 47. Additionally, Article 67(d) of the *San Remo Manual* reinforces the principle of prevention by authorizing belligerents to attack neutral merchant vessels that "are incorporated into or assist the enemy's intelligence system." This rule would almost certainly apply by analogy to neutral satellite remote sensing systems.

Chapter Six: Conclusion

As a growing number of States become increasingly dependent both economically and militarily on outer space applications such as satellite telecommunications, global navigation satellite systems and satellite remote sensing systems, history and logic dictate that they will seek to deny these applications to their enemies during periods of armed conflict. While international efforts to ban the placement and/or use of weapons in outer space have failed to gain traction, denial and negation measures such as those discussed in Chapter Two will not escape international legal scrutiny. In particular, the law of neutrality will apply. Grounded in a pragmatic acceptance of armed conflict as a reality of international relations, the law of neutrality provides a flexible and dynamic set of general principles designed to serve as a mechanism to balance, mediate and reconcile competing claims of belligerents and neutrals during armed conflict with the ultimate goal of limiting the spread of hostilities and their impact on international trade.

This thesis has provided a preliminary analysis of how the general principles underlying the law of neutrality may be applied by belligerents and neutrals during armed conflict in, from and through outer space. While the principle of impartiality will most likely prevail in the context of neutral satellite telecommunications and navigation satellite systems, the principles of abstention and prevention will most likely apply to satellite remote sensing. Even if, however, neutral States maintain the right to provide satellite telecommunications and navigation services on a non-discriminatory basis, belligerents will almost certainly seek to adapt and apply the traditional belligerent rights

of contraband, blockade and undersea cable cutting to prevent enemy use of neutral satellite signals. Given its flexible and pragmatic nature and history, the law of neutrality will evolve to accommodate these belligerent rights, but only to the extent any particular belligerent asserting them maintains the political and military wherewithal to enforce them in practice. In other words, belligerent measures in this respect must actually be effective – if not, they will be recognized neither in law nor practice.

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I. Miscellaneous

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